ELECTRICAL REVIEW

ILLUSTRATED.

A WEEKLY JOURNAL OF

Electric Light, Power, Telephone, Telegraph and Scientific Progress.

VOL. 15, No. 21. WEEKLY. | NEW YORK, SATURDAY, JANUARY 18, 1890. | $3 per annum. Single Copies, 10 Cents.

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Entered at Post Office, New York, as Mail Matter of the Second Class.

Mining Car Motor.

The electric motor car, illustrated on this page, is manufactured by the Jeffrey Company, Columbus, O. In a recent issue, *The Engineering and Mining Journal* describes and compliments it as follows: "The electric motor on this machine is arranged with a reverse rigging, which consists of a brush-holder carrying four brushes, two being in contact when the car runs forward, the other two when running in the opposite direction. The main frame, rectangular in shape, is made of cast iron, with soft steel tires on the car wheels. The motor is located in the center of the frame and transmits power from the armature shaft through a succession of straight gears to the axles. The car is arranged with drawbars and pilots on each end. The speed of these motors vary according to the work they have to perform. There are motor cars of this description running in coal mines, hauling loads over as high grades as 4½ per cent. with perfect ease, at the rate of 3½ miles per hour. The machinery being compact and occupying but little space, brings the operator near the parts it is necessary to handle in order to operate the car. The operator is able to turn on the current with one hand, and at the same time is able to handle the brushes or brake. Power is conveyed to the motor by means of a trolley, running on a trolley line, invented by D. D. Osyor. The motor cars carry their own lights, which is a great advantage in coal mines, and can be handled as easily, safely and quickly, as any steam locomotive."

A Wire Thief Caught.

Sneak thieves are beginning to appreciate the value of covered wire. Two of them while passing the offices of the Empire City Electric Company, on Dey street, this city, picked up a large coil of wire, which, with a number of others, had just been put down in front of the office waiting to be shipped. Mr. Fred. Timpson, of the Empire Company, caught sight of the thief as he passed rapidly down the street accompanied by his pal, and instantly gave chase. The coil of wire was dropped, and both chaps took to their heels, but Mr. Timpson had a good head of steam on and overtook the one that took the wire after a spurt of two blocks, and before the thief could get his breath or realize the situation he was handed over to the tender mercies of the police court, and is now in durance vile meditating over the dangers of handling wire that does not belong to him. Mr. Timpson is receiving congratulations over the Maud S. time he made down Dey and Church streets, and from the vigorous manner in which he pulled down the flying rascal and saved the wire.

Damage to the Wires by a Cyclone.

The telephone systems of Buffalo and Rochester, New York, were badly damaged by a cyclone, Monday of this week. The telegraph wires were also blown down, and all that section of the state has suffered great loss. The long distance telephoning between these two cities and New York, as a consequence, was stopped, and all telegraphing ceased. The full effects of the storm will be reported in our next issue.

Travelling Arrangements to the Kansas City Convention.

The following circular relating to this matter has just been issued by the transportation Committee:

Dear Sir: For the benefit of delegates and others attending the Eleventh Convention of the National Electric Light Association, to be held at Kansas City, February 11th–14th, arrangements have been made with the Pennsylvania Railroad to provide a magnificent vestibule train to be known as the "Electric Limited," to be run through without change to Kansas City, via Chicago and the Chicago, Burlington and Quincy Railroad.

This train will leave Jersey City, Sunday, February 9th, at 9.45 A. M., sharp, arriving at Chicago, Monday morning, at 9 A. M.

Monday will be spent in Chicago, the Chicago Electric Club having kindly invited the eastern delegates to enjoy its hospitality during their stay in that city.

The "Electric Limited" will leave Chicago Monday evening at 5 o'clock, arriving at Kansas City early Tuesday morning.

Passengers should be careful to take the ferry at foot of Cortlandt or Desbrosses streets, New York, not later than 9.30 A. M. Sunday.

No effort has been spared by the Transportation Committee in obtaining the very best equipment, and the committee is assured that this train will be the finest ever run out of New York. It will be composed of the latest Pullman vestibule sleeping cars, lighted by electricity, a dining car, composite car containing barber shop, bath room, card room, library, waiting desk, smoking room, etc., and an observation car with a large open room luxuriously furnished, as well as an observation platform.

The train will be supplied throughout with fixed and portable electric lamps.

Special accommodations will be provided for members accompanied by their wives.

The rate of fare going, including sleeping car accommodations, will be $39.75, and inasmuch as it is necessary to guarantee a certain number of people in order to secure this superb train, it is important that those who propose attending the Convention fill up the enclosed blank and return same together with remittance as promptly as possible, to C. E. Stump, chairman Transportation Committee, *Times* building, New York, upon receipt of which, railroad and sleeping car tickets will be at once forwarded.

Extensive preparations have been made to render this one of the most interesting conventions ever held, and it is expected that members will do their utmost to induce as large an attendance as possible.

The Patten System of Electric Distribution.

In two recent issues of the ELECTRICAL REVIEW, of New York, we find a proposed arrangement of an alternate current generator and its circuits, which is described as a new three-wire system of distribution. It is due to Lieut. Patten, and it is claimed for it that it presents several features which enable effects to be obtained which usually accompany direct current only, while at the same time it gives also the ordinary alternate current effects. Briefly, it is proposed to commute the alternate current at the generator, and to send all the positive waves in one direction through a wire, M^1, all the negative waves through another wire, M^2, while a third or middle wire, M^3, is to act as a common return for both waves. It is suggested that direct current apparatus may be placed in either the M^1 or the M^2 circuit, or that both these circuits may be included in the same direct current apparatus—of course, the proper directions to give the same directive effect being observed; while alternate current apparatus may be placed in the common return M^3.

JEFFREY ELECTRIC MOTOR MINE CAR.

Without going into the details of the proposed arrangement of this system in connection with secondary batteries, electric motors, and arc lamps—which details show that the author of the scheme is not very familiar with the requirements of practical work with these apparatus—it will be evident that all the "direct current" effects aimed at could be much more simply obtained with two than with three wires. There is absolutely no advantage in the use of three wires in this way, so far as our reading of the proposal goes, while there is the great disadvantage that in either of the circuits M^1 or M^2 there is not only a discontinuous direct current, but the discontinuity amounts to having idle intervals between the successive waves equal in duration to the waves. In order to get even an approximately continuous direct current it would therefore be necessary to use both circuits in conjunction, and this only gives in a very roundabout way what would be obtained by using an ordinary commutator, as has often been proposed, and sending the alternate current after commutation through an ordinary single circuit. —*The Electrician, London.*

EXECUTION BY ELECTRICITY.

A REPLY TO ELBRIDGE T. GERRY, BY ALLAN V. GARRATT.

[Written for the ELECTRICAL REVIEW.]

"Sit thee down, Citus: slaying is the word;
It is a deed in fashion. Hark thee, Citus."

It is proposed by the present writer, not to adduce all or even many of the arguments against legalized killing by electricity, but to reply specifically to the arguments advanced by Mr. Elbridge T. Gerry, in an article entitled "Capital Punishment by Electricity," in the September issue of the *North American Review*.

Both from the reputation of the author and from the character of the magazine in which it appeared, the article in question may be looked upon as fairly typical of the arguments which have been uppermost in the minds of those who have honestly and from philanthropic motives brought electric killing thus prominently before the public, as a law of the State of New York. As such it is worthy of a reply, for it must be remembered that the subject as set forth in the daily press, has unfortunately been so tainted with personalities and involved in strifes between great electrical interests that the unprofessional reader has stood but small chance of obtaining unprejudiced opinions therefrom.

The article to which this is a reply was written by a lawyer and a philanthropist; the present writer has only a layman's knowledge of law, and hence will not attempt to argue the question of the unconstitutionality of electric executions. Neither does he feel any especial philanthropy for those deserving the death penalty, and cannot for the life of him see why we should bother ourselves about devising means to make the last moments of the felon less painful physically than those of the law abiding citizen who passes into the great unknown, in the anguish of a lingering and fatal sickness. To the unphilanthropic person it seems much more important that when we take life deliberately, under provision of the law, we shall strive to prevent that act from brutalizing ourselves, rather than to aid the criminal to avoid the almost universal pangs of natural death. On the other hand, the absence of especial desire to make the last moments of the criminal more than ordinarily painless, does not of necessity pre-suppose a desire to inflict torment upon him in his last moments, which would in most cases obtain if electrical execution goes into effect.

The larger portion of the article by Mr. Gerry is devoted to a very able treatment of the origin, historical development and present state of the art of inflicting the death penalty, and it is only near the end that electricity and death by electricity is mentioned at all; the whole subject being dismissed with a few bold and perfunctory statements which leave a strong impression on the mind of the unprofessional reader that in arguing in favor of legal killing by electricity the phenomena of electricity and their effects upon the living human organism are of secondary importance.

It is self-evident that the subject cannot be thus dismissed. Like Banquo's ghost, "it will not down;" the subject is deeply

rooted in the public mind. Since the first criminal was sentenced to death by electricity in the State of New York, over 70 columns of matter, on this subject, have been printed in the daily papers of New York City; enough matter to fill four numbers of the ELECTRICAL REVIEW. The present writer has preserved this mass of newspaper clippings in a scrap book. If, by chance, it is preserved and comes to light in a future generation, it will create the impression that the people of New York went out of their heads on the subject of electrical execution in the year of our Lord 1889.

A whole literature of the subject has grown up and no less than 18 words have come into the language—probably temporarily, most of them—to denote the act or state of electric killing. They are as follows: Electromort, thanelectrize, thanatelectrize, thanatelectrisis, electrophon, electricise, electrotony, electrophony, electroctony, electroctasy, electricide, electropœnize, electrothenese, electroed, electrocution, fulmen, voltacuss and electrostrike.

The whole nation is deeply interested, not in the history of legal killing as an art, but in this question: Shall electricity be substituted for hanging as a means of execution, and if so, why?

Mr. Gerry's argument resolves itself into the following syllogism. Hanging as a means of execution is open to certain objections; killing by electricity is free from the objections to hanging; therefore substitute electricity in the place of hanging. It is with the minor premise of the above argument that the present article deals, for everyone will admit that hanging is open to the objections which Mr. Gerry has so forcibly set forth; namely, it is cruel, it may not produce death instantly, and it sometimes mutilates the body.

Now it is argued, first, that "electricity has yet to be proven to be cruel." This would at first seem to wholly depend on whether electricity produces immediate insensibility or not; this does not decide the question, as will be shown later on. The writer is in correspondence with more than 100 persons who have been traversed by high tension currents (over 1,000 volts) and has himself been knocked insensible by a current passing from hand to hand, the hands being moistened with dilute sulphuric acid and grasping the terminals of wires having a difference of potential of 675 volts and short circuiting at 20 amperes; he is therefore somewhat able to understand the sensations of others who have been traversed by more powerful currents. The universal testimony of all such persons, whose unprejudiced testimony can be obtained, is, that to be traversed by a powerful electric current, beggars description. To read a score of these letters makes one's flesh crawl, and reminds one of the tortures of the Jews in the Middle Ages.

But it is argued electricity produces death instantly. This statement is strangely at variance with fact. To make this argument of any value it must be proved that electricity always produces death instantly. Hanging *usually* produces death instantly; because it does not always do so is Mr. Gerry's argument against its use. Cases are on record of persons who have lived a considerable length of time under the most excruciating torture, with high tension currents passing through them, and several cases where after being released from the source of electricity they have lingered in agony a day or more. It should also be noted in this connection that a powerful electric current usually produces a *tetanus* or state of rigid spasm, which has all the external appearance of insensibility. Nothing is more common than for a person to say that he was conscious all the time the current was passing through him, but was unable to move a muscle, cry out, or otherwise show that he was alive.

But let us for a moment consider the quickest electric shock which a person can receive. If a person is knocked insensible by a discharge of static electricity, as for example from a battery of leyden jars, whatever sensation is felt is produced by a current of electricity lasting not more than an infinitely small part of a second. Insensibility is produced so quickly that the person neither sees the spark nor hears the report, yet the sensation is terrible. Thought and sensation are not altogether limited by duration of time. Under certain conditions, as for example while dreaming or drowning, one may think or feel a great deal in a very short space of time. Who has not dreamed that he has fallen an interminable distance when he has rolled out of bed, while asleep, and fallen a foot or two. It is as old as human experience. Mahomet "made a night journey from Mecca to Jerusalem and thence to the seventh heaven, and returned in time to prevent the complete overturn of a vessel of water, which the angel Gabriel had struck with his wing on his departure."

But, it is argued, no pain can be felt from a death-dealing electric shock, because nerve sensation is slower than electricity. This is very bad logic, for it, of course, pre-supposes that the velocities of electricity and of nerve sensation are fixed quantities, whereas they are very variable quantities. All that we know on this point is that nerve sensation *sometimes* travels slower than electricity *sometimes* travels; whereas, to prove the point, it would be necessary to state that nerve sensation *always* travels slower than electricity *always* travels. There is good reason to believe that, through the human body, the velocity of an electric current is slower than the maximum velocity of nerve sensation. The argument, therefore, becomes absurd.

It is argued "that a current of electricity, of sufficient pressure, purposely and directly applied to the human body, will certainly and instantaneously destroy life, is demonstrated by the 90 cases of accidental death by electricity where no such application was intended." This, again, is a case of loose reasoning; and, admitting—only for the purposes of argument—that 90 persons have been accidently killed in this way, it can be shown that this is not a conclusive, nor even a strong argument that persons can be certainly killed in this way. A similar argument will demonstrate this point; for example, in the last five years 1,405 persons in this country have succeeded in committing suicide by hanging; *ergo*, hanging is a certain method of killing. It is evident that to prove by this means that hanging is certain, we ought to be able to show that all persons who attempt suicide in this way succeed. The facts of the case are that many who try to hang themselves fail, and, as we would suppose from such data, the professional hangman sometimes fails to kill until after several trials. In regard to electric killing it is instructive to note that there are in this country not less than 800 electric light companies using high tension currents, and in a very large proportion of these you will find that some one or more of the employés have received shocks that have shaken them up badly, only a very small number of persons having been killed. The chances of being killed by electric currents are much smaller than is popularly supposed. The writer has, for the last year, compiled statistics on this subject, and finds that where one person in this country is killed by electricity, 78 break their necks (without aid of the halter), 34 are fatally poisoned, 30 are smashed up beyond recovery, 24 are burned to death and 9 are suffocated.

The comparative statistics of drowning are intentionally left out because of the exceptional case of the Johnstown disaster. The above figures should probably be higher than they are for the reason that all persons who have died soon after receiving an electric shock have been classed as cases of electric killing; whereas, a large number of those persons were linemen, who, having received electric shocks fell from the top of electric light poles and broke their necks or received other injuries which would have proved fatal.

It is impossible to formulate any rule as to the amount of electric pressure (voltage) that is necessary to kill. The writer has in mind two cases: One man was killed by a 1,500 volt current, and the other was only slightly injured by a 3,000 volt current of the same kind, the current passing through the two men in precisely the same way. Again, two men, one who was killed by touching his hand to a wire of a given voltage; the other was held down by two wires (of the same difference of potential or voltage as the previous case) for several seconds, one wire being against the side of the head, the other being against his side. Severe burns and temporary insensibility followed by great depression and ultimate blindness were the results in the latter case.

One successful execution by electricity would not prove its desirability. A large number of electrical executions would have to be made which should average better than an equal number of hangings.

Biologists tell us that the phenomena of death are no less mysterious than the phenomena of life. Why death should take place is often quite as mysterious as why there should be life. The slap of the hand on the bare stomach has been known to produce death in a person not pre-disposed to heart disease. The writer has seen, in Africa, a native die from the bite of an insect which the whole tribe held to be deadly, and he has also seen a white man, unacquainted with this tradition, only slightly inconvenienced by the bite of the same insect. The whole phenomena of death is largely a *terra incognita*. The law in regard to hanging specifically says he shall be hung by the neck *until he is dead*.. Was it the idea of the philanthropists that the criminal shall be placed upon the rack and tortured with electricity *until he is dead*, or did they have in mind the sudden cutting-off of life which is *occasionally* the result of being traversed by a powerful electric current?

One of the objections against hanging, which it is argued will be avoided in electric execution, is the mutilation of the body. A current of electricity in overcoming resistance does one or both of two things; it generates heat or produces chemical changes. The amount of heat is directly proportional to the amount of resistance overcome and the time the current acts, and it is also proportional to the square of the current. For example, two units of electricity, forced through a thousand ohms of resistance, produces a thousand times as much heat as through one ohm; if it acts for 10 seconds, 10 times as much as for one second; and eight units of electricity in a given time will produce 16 times as much heat as two units. A current of electricity traversing a human body produces both heat and chemical change. A current strong enough to be *likely* to kill would produce a great amount of heat and considerable chemical change if allowed to act for more than an instant of time. This is a ghastly subject and the purposes of this article do not demand that we go further into the matter.

To sum up the facts so far advanced, we find that hanging is cruel (killing is apt to be); it does not always produce instant death, and it may mutilate the body. As for electricity, we know that in most of the cases so far observed, it has been an excruciating torture. It may produce death suddenly, or it may produce it slowly, and in the latter case considerable mutilation of the body and excruciating suffering will take place.

It is evident that the arguments so far advanced very imperfectly cover the whole question of electric execution. The complication of the apparatus necessary to produce death with any reasonable quickness; the fact that such apparatus would be dangerous to handle, and could not be safely nor surely operated (these words are used with a full knowledge of their meaning) by persons unfamiliar with the care of electrical apparatus; the effect upon the morals of the non-criminal as well as the criminal classes; the mental agony of a criminal being scientifically adjusted in the machine which is to produce the killing, and the necessity for scientific executioners, are subjects which may well "give us pause."

To treat of this subject fully would be to write a book. It is to be hoped that public opinion on this subject will be formed on what we know about electric killing and not on what we don't know about it; for as Herschel has said:

"Every student who enters upon a scientific pursuit, especially if at a somewhat advanced period of life, will find not only that he has much to learn, but also much to unlearn, and, as a first preparation, therefore, for the course he is about to commence, he must loosen his hold on all crude and hastily adopted notions, and strengthen himself by something of an effort and a resolve for the unprejudiced admission of any conclusion which shall appear to be supported by careful observation and logical argument, even should it prove to be of a nature adverse to notions he may have previously formed for himself or taken up without examination on the credit of others. Such an effort, is, in fact, a commencement of that intellectual discipline which forms one of the most important ends of all science."

Increasing in Members.

Through Mr. R. W. Pope, secretary, we learn that a number of new members have been added to the American Institute of Electrical Engineers since the revised list was published, November 1, 1889. Among the the new members are H. V. Hayes, Boston; John G. Moore, New York; Captain S. W. Roessler, U. S. A.; W. J. Hancock, Australia; Geo. P. Wardell, Newark. The following associate members have been transferred to full membership upon approval of the Board of examiners: Dr. Chas. B. Dudley, Altoona, Pa.; J. T. Marshall, Harrison, N. J.; Leigh Carroll, Birmingham, Ala.

The Year's Business of a Great Electric Lighting Company.

The year which has just closed has been the most eventful in the history of the Westinghouse Electric Company. The business done during 1889 surpassed anything ever anticipated. The company has now 266 central stations distributed throughout the country and abroad, which are fitted up with Westinghouse alternating current apparatus. The contracts for 134 central stations were secured during last year, making the business of that period exceed the combined amount of the previous years since the organization of the company in 1886.

These 134 central stations represent an aggregate capacity of 234,250 incandescent lamps. This does not include the various increases which were also contracted for by various companies already established.

To show the enormous growth of the concern, the following comparative facts may be interesting:

In January, 1889, the company employed 650 men in their works on Garrison alley, Pittsburgh, Pa. During this year many improvements were necessitated, and to-day the company employs 1,300 men in Pittsburgh alone. A new building of five stories was built during the year for the detail department, a pottery and a laboratory. In the detail department the alternating current meters are made. The production of that article, we are informed, has increased 400 per cent. during the year. In the pottery—which, by the way is a complete factory—switches, cut-outs and other devices are made. The laboratory has been fitted up with all those requisites which make a place of that kind perfect, and the Westinghouse laboratory is now considered by those who have visited it the finest and most complete in the country.

The machine shop has been repeatedly enlarged to meet the demand made upon it by the increased number of contracts. Several new engines were put into the building, and a new battery of boilers consisting of two Babcock and Wilcox boilers, 500 horse-power each.

The lamp factory of the company was removed during the year to New York to give more room to the converter department.

In March, 1889, the company started in the arc lighting business by absorbing the Waterhouse Electric and Manufacturing Company, of Hartford Conn. This gave a fresh impetus to that business, and the number of Waterhouse machines sold since then has been large.

During the year the company also established a branch in London, England, for the purpose of taking care of the European business, and the accounts received from there are very promising.

A Good Suggestion.

It seems as though it were time to establish an electrical library at the Boston Electric Club, now that they are considering enlarging and improving the club rooms by moving to more commodious quarters.—*Boston Commercial Bulletin.*

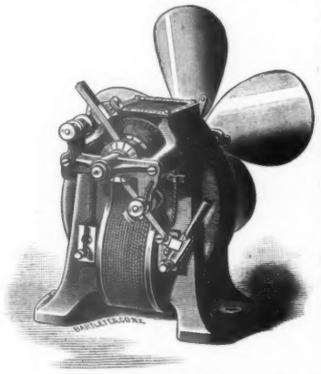
The U. S. Electric Lighting Company's New Motor.

We illustrate herewith a new type of direct current motor designed and manufactured by the United States Electric Lighting Company. These motors are being made in the following sizes: ⅛, ¼, ½, 1, 2, 3, 5, 10, 15 and 20 horse-power for potentials up to 500 volts, and will be specially wound for higher electro-motive forces if desired.

The efficiency of small motors heretofore produced has been impaired by the amount of wire found necessary to wind upon them. By constructing these small motors on the plan followed in the construction of large dynamos, viz, very low armature resistance and great strength of field, the United States Company has been enabled to produce small motors of very high efficiency. By a careful proportioning of the relative magnetic strengths of field and armature, these motors run with a fixed point of commutation, and as a consequence the brushes and commutation operate with a minimum amount of attention, there being no spark under all conditions of load.

In order to maintain the strong field magnetism employed in the motors with a maximum efficiency, the armatures are constructed so as to reduce the resistance to the flow of magnetism from pole to pole to a minimum by the use of an armature core which projects beyond the armature wires. As a consequence the air space between the field and armature core is less than $\frac{1}{10}$ of that usually adopted for this work.

One of the mechanical advantages of the motor is that all armature wires and bands lie beneath its surface and are, therefore,



thoroughly protected from injury. A uniform standard of 2 per cent. less in field and armature is employed for all motors smaller than three horse-power, and 1½ per cent. for the larger sizes. As a result the temperture of the motors at full load is extremely low.

The starting device for throwing the motor in and out of circuit is located upon the motor itself, the use of resistance boxes being thus avoided. For all motors in excess of 220 volts potential a special starting device is used which is enclosed in a case with a glass top, so that all casual contact with the terminals or live portions of the machine is prevented.

The motor brushes for high potential motors are also held in hard rubber brush holders lined with metal, and are so constructed that no shock can be received from either brush or holder.

The one horse-power motor and all larger sizes are supplied with a base and a device for belt tightening, where desirable.

The motors run with a minimum amount of noise and at moderate speeds. They may be seen in operation at the company's showroom, 120 Broadway.

Sheffield, Ala.—The Hall & Edwards Electric Company has been organized, with E. A. Edwards, president, and J. V. Allen, secretary, to manufacture electrical appliances.

Milledgeville, Ga.—An electric light company has been incorporated by W. T. Conn, T. O. Powell, W. S. Brooks and others, to erect and operate an electric light plant. The capital stock is $10,000.

Portland, Me.—The Economic Electric Manufacturing Company is to carry on business as represented in its name. The capital stock is $2,000; but nothing is paid in. The officers are, president, Robert Amory, Nelson V. Titus, Frederick H. Osborne, Benjamin E. Dutton, Geo. E. Parker.

Baumann's Method for Joining Telephone Wires!

The usual method of joining telephone wires by soldering, presents certain drawbacks, amongst which the risk of fire has to be seriously considered. J. Baumann, of Munich, proposed to dispense with soldering in the following way:

The joint is formed in the usual way by twisting the ends of the wires round each other. A small lead tube is then slipped over the joint, and, by application of pressure (as is done for leading railway carriages), is made firmly to adhere to the wires. The lead tube is made of sufficient length slightly to overlap the twisted portion of the wires, and the joint is thus secured against moisture and oxidation.

This method may be applied in a simplified form to conductors placed inside a dwelling. The effect of traction in this case being less, the twists may have fewer turns, and the lead tubes may be shorter.

The following is the simplest way:

A small caoutchouc tube, corresponding to the length of the joint, is slipped over one of the wires to be jointed; the twisted ends of the wires are compressed by means of the lead sleeve, and the caoutchouc tube drawn over the whole. Only in exceptional cases, insulating substances, like Chatterton's compound, are employed.—*The Telephone.*

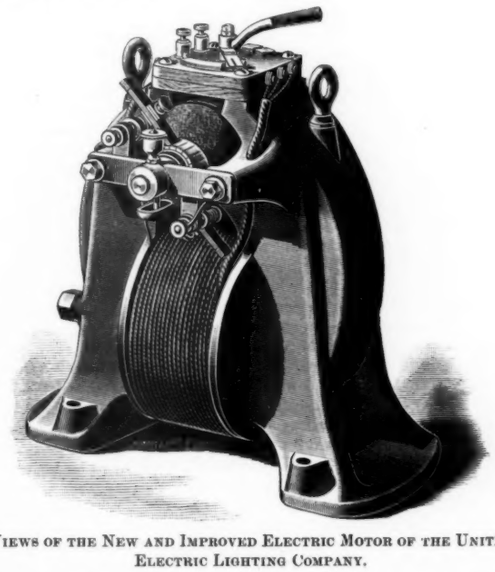
Streator, Ill.—The Streator Railway Company, at Streator; to build and operate street railroads in La Salle and Livingston Counties, etc.; capital stock, $250,000; incorporators, Daniel Herman, G. L. Richards and Milton Hicks.

Chicago, Ill.—The Mills Interlocking Switch Company, at Chicago; to manufacture interlocking railroad switches; capital stock, $100,000; incorporators, F. J. Hoyt, Milton Weston and M. B. Mills.

Detroit, Mich.—Edward D. King, Frank C. Gray and William H. Connor have incorporated the St. Clair Flats Cable and Marine Reporting Company. The capital stock is $10,000. The object is to lay submarine cables and overlaid wires between Algonac and St. Clair Flats to aid them in reporting marine news.

Sheffield, Ala.—The Hall & Edwards Electric Company, of Sheffield, has been organized with E. A. Edwards, president, and J. V. Allen, secretary; to manufacture electrical appliances. The company will meet January 18, 1890, to consider the issuance of $125,000 of bonds.

Chartiers, Pa.—An application for a charter has been made by Percy F. Smith, J. J. McCormick, William Macrum, George Glass and W. A. Rahn, for a company to be known as the Chartiers Valley Electric Light Company. They will put in a plant near Chartiers and light all the towns in the valley.



THREE VIEWS OF THE NEW AND IMPROVED ELECTRIC MOTOR OF THE UNITED STATES ELECTRIC LIGHTING COMPANY.

Naperville, Ill.—Naperville Electric Company, at Naperville; to construct and maintain an electric light plant; capital stock, $12,000; incorporators, R. E. Travis, C. C. Travis and A. J. Travis.

Champaign, Ill.—Citizens' Electric Street Railway Company, at Champaign; to operate a street railway; capital stock, $150,000; incorporators, J. W. Davidson, W. S. Rayburn, Daniel Morrissey and others.

St. Paul, Minn.—The Rapidan Water Electric Power Company, St. Paul, to manufacture and furnish power by means of water, electricity or otherwise, for a plant to be located at Rapidan, Blue Earth county, capital stock, $100,000.

Dorchester, Mass.—The Milton Power and Light Company has organized as follows: W. A. Stiles, president; G. H. Drew, treasurer; F. M. Smith, clerk; capital, $50,000.

Syracuse, N. Y.—Articles of incorporation of the Marvin Electric Drill Company were filed at the county clerk's office. The capital stock of the company is $300,000, divided into shares of $100 each, and the incorporators, who are the trustees for the first year, are Henry N. Marvin, William J. Gillett and Charles E. Lipe. The company is formed for the purpose of manufacturing, purchasing, selling and leasing electric reciprocating tools, dynamos, motors, etc., and the machinery and appliances pertaining thereto.

Towanda, Pa.—The Towanda Electric Illuminating Company has been granted a charter, and is now ready to commence business in earnest.

Kewanee, Ill.—The Kewanee Electric Light and Motor Company, at Kewanee; to supply heat, power and light; capital stock, $12,000; incorporators, C. E. Barry, J. E. Blish and F. P. Pierce.

Yaquina Bay, Ore.—The Yaquina Bay Telephone Line Company. Stock, $1,000. B. F. Jones, J. H. McNeil and Beal Gaither are incorporators. The line will be run from Toledo to Yaquina City, Ore.

Braintree, Mass.—The Braintree street railway has been organized at that place with a capital stock of $25,000. It is understood that the motive power will be electricity. Francis A. Hobart, of Braintree, is pushing the matter.

North Smithfield, R. I.—The city has voted to contract with the Woonsocket Electric Machine and Power Company for the erection and maintenance of not less than 15 nor more than 17 electric arc lights of 2,000 candle-power.

Idlewood, Pa.—The Chartiers Valley Electric Light Company has been incorporated. President, W. A. Zahn; secretary, Geo. Glass; treasurer, J. J. McCormick. The company intends to supply the rest of Idlewood, Crafton, Ingram and vicinity with the electric light.

Liberty, Va.—Mr. R. Kenna Campbell has organized the Bedford Electric Company; capital stock, $30,000. The stock has all been subscribed. Mr. Campbell has secured an exclusive franchise for 25 years to supply light, power and traction. The street lights will be on the Schuyler arc system. Incandescent lights will also be furnished.

East St. Louis, Ill.—The New Brighton Electric Light Company has been organized in East St. Louis, and will be incorporated with a capital of $20,000. The officers are P. W. Abt, president; T. L. Fekete, secretary and treasurer; Martin Benzen, vice-president. The object of the company is to erect a plant and furnish light for business houses and dwellings and to light the streets.

Portland, Me.—"The B. S. Hale & Son, Incorporated" is formed to manufacture and sell insulated electric wires, cordage, cable, etc. The capital stock is $100,000, of which $76,000 has been paid in. The officers are, president, William Bickford; treasurer, Nelson V. Titus; Directors, William Bickford, Adam Cook, Alphonso H. Carpenter, Charles A. Clark, James B. Hale, O. H. Carpenter, A. M. Ellis.

Hartford, Conn.—Articles of corporation have been filed at the office of the Secretary of State, Hartford, by the Connecticut Development Company, of New Haven, organized for the manufacture and sale of automatic machinery. The capital is $5,000, the par value of shares being $25 each. Following are the stockholders: James J. Lawton, 150; W. W. Pardee, 10; G. H. Clark, 20; I. F. Davis, trustee, 10; R. J. Tracy, 20; Patrick Welch, 10; all of New Haven.

Camden, N. J.—Articles of incorporation were filed in the Camden County Clerk's Office by the National Gas and Electric Fixture Company. The capital stock is $500,000, with $25,000 paid in. The objects of the corporation are to manufacture gas and electric light fixtures. The incorporators are Benjamin Thackara and Clement M. Biddle, of Philadelphia; Heinrick C. Beck, of Brooklyn, N. Y.; John C. Cassidy, of East Orange, N. J.; and Charles H. Fischer of Mt. Vernon, N. Y.

ELECTRICAL REVIEW

Published at 13 Park Row
P. O. BOX 3329.

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REGISTERED CABLE ADDRESS:
"ELECTVIEW," NEW YORK.
"546 JOHN," TELEPHONE CALL.

BOSTON OFFICE:
STEPHEN L. COLES, 196 Summer St.

WASHINGTON OFFICE:
GEO. C. MAYNARD, 1419 New York Ave.

CHICAGO OFFICE:
D. B. DEAN, 61 Metropolitan Block.

EUROPEAN OFFICE:
CHARLES FFRENCH, Bridge House, 181 Queen Victoria St., London, E. C.

SUBSCRIPTION TO THE ELECTRICAL REVIEW.
One Year, United States and Canada, - $3.00
One Year, Foreign Countries, - - 5.00
Single Copy. - - - - .10

ANNOUNCEMENT.

Address all communications and make all money orders and checks payable to order of ELECTRICAL REVIEW, P. O. Box 3329, New York.

No attention will be paid to communications for the REVIEW without the *name and address of the writer.*

NEW YORK, JAN. 18, 1890.

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Flying machines are again attracting attention. When the successful one appears, electricity will be the controlling element.

The popularity of the ELECTRICAL REVIEW is shown by the extensive amount of quotations from it to be found in the daily press.

Mayor Grant deserves some credit for the suggestion in his message that a board composed *partly* of persons who are acquainted with electrical science, should be in charge of electrical matters in New York. Perhaps in time the mayor will go the *whole* board.

Since our editorial on the shortcomings of the Board of Electrical Control, the daily papers of the city seem to have put on their thinking caps. Before that they were clamoring for the wholesale chopping of the wires, and applauding every stroke of the axe. Their inquiries since have led them to a knowledge they might have had long ago.

New York enjoyed the sensation of another man-hole explosion last week. Two of these subway doors were blown high in the air near the corner of 14th street and Sixth avenue, tearing up the street in all directions for several feet. Fortunately no one was hurt, although many were badly frightened. The accumulation of gas is supposed to have caused the explosion.

An interesting communication from Dr. A. V. Garratt, secretary and treasurer of the National Electric Light Association, in reply to Mr. Elbridge T. Gerry in relation to the execution of criminals by electricity, is published in the ELECTRICAL REVIEW this week. Dr. Garratt's points are well taken. Yet in all probability the next enforcement of capital punishment in this State will be by electricity, unless the State Assembly, which is now in session, should repeal the law.

The Electric Club of New York has sustained, in the deaths of Mr. E. N. Dickerson, Mr. Amzi S. Dodd and Mr. M. W. Goodyear, the loss of three of its most widely-known members. Each had many friends and acquaintances in all parts of the country, and Mr. Dickerson was well known in scientific circles abroad. It is with a feeling of sadness that the REVIEW calls attention to this loss of the Club and the community, and we trust that no such vacancies will have to be announced in electrical circles soon again.

We publish in this issue circulars in relation to the next National Electric Light Convention, which is to be held at Kansas City, February 11th to 14th, inclusive. The generous action of the Electric Club of Chicago in offering to entertain the eastern delegates in that city, is one that will be appreciated by all, and will be a pleasant rest on the long trip from New York to the West. The notices from the committee on transportation, which have just been mailed, should receive most prompt attention, for the successful organization of a party large enough to require a special train for that distance requires a great deal of work done in advance.

GOVERNMENT TELEGRAPH SCHEMES.

The desire to induce the government to embark in the telegraph business has brought out some half dozen or more bills which have already been introduced in the Senate and House of Representatives. Not one of them provides a practical plan of even making a beginning in the business. Mr. McComas, of Maryland, has a bill which directs the Postmaster-General to ascertain the amount and character of the wires, apparatus, and other facilities required for the prompt transmission by telegraph, telephone, or other equivalent device, of messages which may be deposited at all places where letters are deposited and at other places to be designated, and to make a contract with telegraph or telephone companies for the use of their lines, or to purchase them if expedient. He is also authorized to negotiate with foreign governments, or with corporations owning ocean cables, with a view of establishing an international telegraphic service, and to report to Congress the amount for which an Atlantic cable can be laid or purchased. Clerks, operators and electricians, are to pass an examination before the Civil Service Commission, and to serve at salaries to be fixed by a board consisting of the Secretary of State, the Secretary of War and the Postmaster-General. Telegraph offices are to be located in the post offices wherever practicable. The rates are to be one cent for each word, between all places in the United States, and priority of transmission can be secured by any person by the pay ment of double rates. Messages are to be delivered by letter carriers. They are to be deposited in letter boxes and will be forwarded by mail over any part of the route where there is no line. This bill does not prohibit any private company from engaging in the same business, if it can compete with the government, which is not required to make its undertaking self-supporting.

Another scheme is embraced in a bill presented in the Senate by Mr. Cullom, and in the House by Mr. Bingham, of Pennsylvania. This provides for a limited postal telegraph service between all free-delivery post offices, under a five-year contract with any companies now existing or to be organized, and at rates and under regulations to be prescribed by the Postmaster-General.

A bill introduced by Mr. Morse, of Massachusetts, proposes to make a clean sweep, and at once establish telegraph service at all places where there is now a telegraph office, under a five-year contract with private companies, which are to take, as their full compensation, all the receipts, except three cents on each message, which the government will reserve to itself. In this case the company is to furnish all the operators, and where the receipts are not sufficient to pay the operators' salary, it is at liberty to employ the Postmaster and allow him half the receipts. The tariff on messages of 20 words, or less, exclusive of date, is fixed at 20 cents for 1,000 miles ; and 5 cents for every 250 miles or fraction thereof, in excess, no rate to exceed 50 cents ; these rates to cover the cost of immediate delivery.

Another bill, presented by Mr. Anderson, of Kansas, comes forward with a breezy prairie freshness and vigor, and proposes to make an appropriation of $10,000,000 to be immediately available, "in order to facilitate the transmission of intelligence among the people, to promote commerce between the several States, to prevent a monopoly inimical to the general welfare, and to expedite public business by enabling the government to forward telegraphic letters at a speedier rate than written letters can be conveyed by steam," by the creation of a postal telegraph system of three main lines, including a northern line from Bangor, Me., to St. Paul, Minn., a central line from New York City to Topeka, Kas.; and a southern line from Baltimore, Md., to San Antonio, Texas; with "branches" leading to nearly all the principal places in the eastern half of the United States. It is specified that the line shall be "first class," built of cedar poles, 40 feet long, with a capacity for carrying 24 wires, and no part of it shall cost more than $500 per mile for a line of six wires. One of the unique stipulations in this bill is that, if after due investigation by the Postmaster-General, it is found that "a line composed of insulated wires laid underground will be more durable and efficient, and if the original cost thereof will not be 25 per cent. greater than that of the pole line, he may construct such line." The entire system is to be constructed within four months, and authority is given for having the whole, or any part of it built by the Army Signal Corps, if it can be done cheaper in that manuer. The Postmaster is to make this telegraph a part of his department, with a superintendent at a salary of $3,000 and an electrician at $2,000.

On the 6th inst., the Senate passed a resolution, introduced by Mr. Dawes, directing the Postmaster-General, to furnish such information as is in the possession of the department, upon the probable cost of connecting the free-delivery post offices of the country with the Western Union or some other telegraph company, and the opinion of the department upon the feasibility and desirability of making such connection ; also, such information as is in the possession of the department, and the conclusion of the depart ment thereon, upon the probable cost of the erection by the government of an indepen dent telegraph line connecting such offices between the cities of St. Louis, Chicago, Philadelphia and New York.

All of these projects are referred to the Post Office Committees, and the controversy which has agitated the country for years past will go on. The development of the long distance telephone, as a means of "transmitting intelligence," which postal telegraph advocates claim as the prerogative of the government, has rendered the undertaking more stupendous and complicated.

In 1871, Postmaster-General Cresswell, who had given careful study to the subject, and was a most determined advocate of a government telegraph, after reciting the experiments in foreign countries, and referring to the great success of the undertaking of the British government, declared, "The Post Office Department is now prepared to undertake the organization and management of the telegraph in connection with its other duties." He strongly urged the purchase of the lines of all telegraph companies then in operation, and the assumption by the government of the exclusive right and authority to conduct the business of transmitting telegraphic messages. In 1872, Mr. Cresswell renewed his recommendations and asked the appointment of a commission of practical men to investigate the subject and prepare a plan for carrying his theories into practice. He submitted to Congress an exhaustive statement, showing a clear comprehension of the matter, and made a very forcible argument in favor of the scheme.

In 1873 he again renewed the attack, which by this time, owing to a long controversy with the Western Union Telegraph Company, had developed a good deal of temper and bitterness. During all this period, the chief signal officer had been serving as an exceedingly aggressive *picador*, and had managed to keep the Western Union bulls in a state of furious rage.

When General Cresswell retired from the department, in 1874, telegraphic enthusiasm disappeared, and the only reference to the subject made by his successor, Marshall Jewell, was in the remark that "the time has come when a resolute effort should be made to determine how far the Post Office Department can properly go in its efforts to accommodate the public, without trespassing upon the sphere of private enterprise. There must be a limit to governmental interference, and, happily, it better suits the genius of the American people to help themselves than to depend on the State."

Nothing was done in reference to the matter by General Tyner or General Key, during their administrations, which ended with the year 1879, except that, in the last-named year, a special officer who made a careful investigation of postal systems in Europe, reported that "the officers of the British Telegraph Department express the opinion that the control of the telegraph lines by the government has been beneficial to the public, but has not produced a satisfactory result from a financial point of view."

In 1880, Postmaster-General Horace Maynard stated that he had examined the system of telegraphy connected with the British Post Office, and found it greatly beneficial to the public and profitable to the government, and asked "is it not time for us to renew the inquiry whether it is wise to leave this important instrument of correspondence in charge of corporations whose primary object is gain to the managers and stockholders, and the convenience of the public secondary only."

Thomas L. James, who was the head of the department in 1881, had nothing to say about telegraphs, but, in 1882, his successor, Timothy O. Howe, strongly favored the union of posts and telegraphs under the government. He repeated many of the old arguments and made the interesting statement that when this was accomplished, telegraph operators would supplant many postmasters, and this would result in giving to the administration of many offices, men who have learned to do one thing, in place of those who have never learned to do any thing.

The next Postmaster-General, Mr. Gresham, did not favor the scheme, and the following four years passed without any reference to it.

In 1888, General Don M. Dickinson recommended the appointment of a commission of men learned in the science and art of telegraphy with authority to erect experimental lines and test new inventions. He believed that the inventive genius of the country had reached a stage in discovery in electrical science when the troublesome problems of excessive cost and lack of privacy in the telegraph business may be solved. At that time Mr. Dickinson evinced a very deep interest in the automatic fast-printing telegraph system, invented by Mr. E. J. Mallett, and, it was supposed, he relied on that discovery to solve the problems which stood in the way of a postal telegraph.

The unfortunate death of Mr. Mallett and the unsolvable problem which the democratic party encountered about the same time, prevented the accomplishment of these designs, and opened the way for a trial of Mr. John Wanamaker's methods, which, so far, do not appear to have brought the era of cheap telegraphy much nearer.

ELECTRICAL NEWS.

What is Transpiring in Electrical Circles in the Leading Cities.

OUR BOSTON LETTER.

The effects of the influenza are still felt in electrical circles here. Nearly all the offices are running short-handed, in some instances one man being compelled to do the work of four or five. The stenographers seem to be the last class afflicted, and many firms are greatly delayed in their correspondence.

The electric sweepers built for the West End Company, by the Thomson-Houston Company, did efficient service during the snow-storm on Friday. It would be interesting to calculate how much manual labor these machines save, to say nothing of time.

Mayor Hart's inaugural address has the following under the head of "Electric Wires and Appliances": "The fire on Thanksgiving day calls for certain changes in our building laws. Should the City Council grant the necessary authority, I shall be glad to appoint a commission for a general inquiry into this subject, together with that of electric wires and appliances."

Practical Talks.—The members of Horse Railroad Men's Union, No. 4, will conduct a series of lectures during the winter of practical value to all street railway employés. The first lecture was by Professor McCluskey on electricity, and he spoke for an hour or more upon the application and use of electricity as a motive power. The lecturer gave the street railway men much practical information.

Rockville, Conn.—The streets were lighted with electricity for the first time on the night of January 5. There were 74 lights in operation, and the streets were thronged with people.

Blackstone, Mass.—The citizens of this town are agitating the project of lighting the streets with electricity.

Boston will save $73,000 on electric lights during the coming year, it is claimed. On Thursday, Mayor Hart notified Mr. Allen, superintendent of lamps, to inform the Suburban Light and Power Company that they had been awarded the contract for lighting the city proper and subways. Their bid was as follows: Boston, South Boston, Dorchester and West Roxbury, 39.74 cents a lamp per night; for Roxbury, 37.99 cents a lamp per night. There are 800 lamps in the city, and the difference in cost, Supt. Allen says, will approximate $73,000 a year.

The Suburban Light and Power Company has been formed on the old franchise and privileges which were owned by the Brookline Gas Company. It is understood that the Westinghouse apparatus will be used, and Mr. Geo. Westinghouse is expected to be in the city within a few days on business connected with this contract.

The new company will be ready to light Roxbury, West Roxbury and Dorchester within six weeks, South Boston within 12 weeks, and Boston proper within 16 weeks. Meanwhile the Boston Electric Light Company will supply the city with light.

New England Electric Exchange.—The regular quarterly meeting will be held at the rooms of the Boston Electric Club, 7 Park street, on Monday, Jan. 13, at 2.30 P. M.

Society of Arts.—A regular meeting was held at the Massachusetts Institute of Technology on Thursday, January 9th, at 8 P. M. Mr. James E. Howard, of the Watertown Arsenal, read a paper on "The Physical Properties of Iron and Steel at Higher Temperatures."

The Evans Friction Cone Company have their system of transmitting power in very successful operation at the following places: Chestnut Hill Pumping Station, North Attleboro Electric Light Co., Jamestown (N. Y.) Electric Light and Power Co., Pettee Machine Co., Fitchburg Steam Engine Co., Putnam Mail Co. and Franklin Electric Light Co. Plants are also being installed where power amounting to 1,500 horse-power will be transmitted by their apparatus.

The Boston Electric Club held its fourth annual banquet at Young's Hotel on the evening of January 6th. The banquet, served in one of the private dining-rooms of the hotel, was in the nature of a new inauguration dinner to the following newly-elected officers: President, Henry B. Cram; first vice-president, A. L. Rohrer; second vice-president, George B. Neal; third vice-president, George W. Adams; fourth vice-president, C. W. Holtzer; treasurer, F. J. Boynton; secretary, R. F. Ross; historian, George W. Mansfield. Nearly 60 members and guests were present. The orators of the evening devoted considerable attention to the recent remarks of public officials in regard to the regulation and control of electric wires, and the demand for legislation in regard to the same.

After cigars were lighted, President Cram announced the new officers for the coming year and called on the secretary, who read letters of regret from Gov. Brackett, Mayor Hart, C. A. Coffin, president of the Thomson-Houston Company, and a telegram of regret from Captain William Brophy.

President Cram then said: "In this club are combined all the scientific and commercial departments of this greatest of applied sciences. This club offers a channel for the discussion of the various subjects of interest to the electrical world and the presentation of the best thought on such matters to our members and the public. Here we hope by free discussion and intelligent decision to relieve the public mind from fear and anxieties which may arise in regard to the transmission of electrical energy. I think I can safely say that there have been fewer accidents which can be laid to the door of electricity than can be laid to steam or any other known means of transmitting energy."

Mr. W. J. Denver, of the New England Telephone Company, the retiring president, said: "I am glad more attention will be paid to the discussion of electrical matters during the coming season, for several reasons. A great deal of talk will be made on Beacon Hill during the present session about electrical matters, which the average legislator but little understands. Efforts will be made to show how wires should be constructed and regulated so as to be entirely safe. My idea is that the better way to do would be to allow that business to go as in the past unhampered. If a sensible code of rules can be formulated, we will all be willing to co-operate in any direction that is necessary in regard to safe-guards. I have some appreciation of the tendencies to make injudicious laws. I think the electrical business will be more prosperous than in the past, if it continues as it has, without interference by unwise legislation."

Mr. Frank Ridlon, the first president of the club, said that he believed the Boston Electric Club ought to be the instructor of the public of Boston on electrical matters in the future. "We want no uniformed legislation," said he, "but we do want legislation based on information. If the legislators will come down among us at our club rooms and elsewhere, it will make possible a very much needed education on electrical matters."

W. A. Stiles, of the Thomson-Houston Company said that "it would be a good idea to ask the police and fire commissioners to a conference, and explain how, by the use of insulated pliers and rubber gloves, blockades of horse cars might be prevented, and possible injury to horses and perhaps men. I believe that lots of unnecessary alarm has been caused here by the many accidents occurring in our sister city of Gotham, but they are not doing good work there. Very few accidents have occurred here. It is our province to allay these fears."

Count Roman I. Zuloff, of Russia, said that he was reconciled to the ugly appearance of the overhead wires by thinking of the compensating advantages resulting from their use. Russia acknowledged its debt to America in electricity. One of the foremost electricians in Russia was a great student of American electrical matters, and he had lately proposed to the Czar an elevated electrical railroad from St. Petersburg to Zaretzim, a distance of 2,000 miles.

Arthur Lord, of the Massachusetts Civil Service Commission, thought there was a danger of too much legislation.

Col. C. M. Ransom congratulated the club on its growth. J. F. Meech, G. W. Mansfield and Dr. A. F. Mason spoke of the necessity of more education of the public mind on the question of electricity. It was necessary that every one, even the newsboys in the street, should know that "volts" meant power, and "ohms" resistance.

Mr. Pond, of the Simplex Electrical Company, states that business is as brisk as ever with his firm. They have orders enough on hand to keep every one busy for some time yet. This company keeps a standing order with the manufacturers to send them braiding machines as fast as they can be made. An order for over 100 of these machines, which have to be made especially for the Simplex Company, is with the manufacturers now.

Mr. Herbert H. Eustis, of the Eastern Electric Cable Company, showed me a pair of cable connections which his firm is just finishing for the Edison station in New Bedford. They are 14 feet 6 inches long, and 1¼ inches in diameter without the braiding, and each cable is composed of 133 tinned copper wires, No. 14 Stubb's gauge. They will be used in connecting the machines with the ampere-meters. Each cable has a capacity of 600 amperes and is almost as flexible as so much hemp rope.

Boston, Jan. 13, 1890. S. L. C.

OUR WASHINGTON LETTER.

Is Senator Butler, of South Carolina, a Convert to Nationalism?—Senator Butler has procured the passage of a resolution, by the Senate, directing an inquiry into the expediency of purchasing, by condemnation or otherwise, the works and property of the Washington Gas Light Company, and to determine what would be a reasonable percentage of profit on the capital stock, and what dividends have been paid during the past 10 years.

Mr. L. N. Cox, who has heretofore represented the Schuyler Company in the South, is now the agent of the Continental Company and the Easton Company, for Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and the District of Columbia, with his office at Washington.

A $200,000 Lighting Contract—for the man who gets it.—The Senate committee on rules has passed an order directing Mr. Edward Clark, architect of the Capitol, to investigate, and, after securing expert testimony, report in writing as to the best system of low voltage electricity, to be used in lighting the Capitol and grounds, with a detailed estimate of cost, both for plant and operating expenses. G. C. M.

Washington, D. C., Jan. 11th.

OUR CHICAGO LETTER.

Chicago Belting Company.—Realizing the growing demand for a fine quality of belts for driving electrical machinery, the above company was organized for the manufacture of belting. The company have secured a large building at 26 and 30 W. Randolph street, corner of Canal, and are now placing the necessary machinery for the manufacturing of all sizes of belting, and within the next 30 days expect to be in readiness for business.

The Electrical Supply Company are in receipt of a large shipment of shades of various sizes and styles. The company are somewhat elated over the recent tests made with their "Shield Band" wire, which after being under water for one hour showed an insulation of 1,100,000 ohms.

The Knapp Electrical Works are enlarging their warerooms and refitting their offices, their steady increase in business demanding the change.

The Electrical Construction Company have closed a contract for wiring the new residence of Mr. Crane, of Crane Bros. Manufacturing Company for bells, electric lighting, etc. The contract calls for 175 lights; conduit system will be used.

Personals.—W. S. Turner, of Woodbridge & Turner, New York, was a late visitor in the city. Mr. Turner reports a fine business for the past year, over a dozen roads having been equipped by his company.—W. L. Allen, of Davenport, Iowa, was in the city last week on a business trip.—W. H. McKinlock left Monday for a short trip in the South.

The Western Electric Railway Association Convention will be held at the Grand Pacific Hotel, Jan. 29th.

The Western Office of the "Review" is in receipt of the Dec. number of the *Street Railway Gazette*, which contains a verbatim report of the eighth annual meeting of the Ohio State Tramway Association, besides other matters of interest, making in all an interesting number of that journal.

The Chas. Munson Belting Company, 28 to 36 Canal street, Chicago, have added to their list of branch houses one at No. 42 Union street, New Orleans. This branch will be fully equipped with everything to meet the demands of the growing Southern trade; in fact, it will have all the facilities of the parent house. The company have placed this branch in the hands of Mr. W. R. McKee, a thoroughly practical and capable gentleman of large business experience, who has been connected with the Munson Company for many years past, and under whose management the house can but succeed.

The Central Electric Company will to-day commence the laborious task of removing to their new stores on Franklin street, which have lately been fitted for their reception.

Christ. H. Stoelting, manufacturer of patent specialties and electric instruments, reports business on the gain and has added a number of men to his force.

The boiler explosion at the Morris Printing Company, on Monroe street, near the Columbia Theatre, on Friday of this week, played sad havoc with the plate-glass in the vicinity, besides injuring a number of persons, some, it is believed, fatally. This accident should act as an argument in favor of the "electric motor."

The Edison Electric Light Company, in Kansas City, are now running over 4,000 lights, an increase of 3,000 during the year of '89. D. B. D.

Chicago, January 11, 1890.

Absorbed by the Edison Company.

The Edison Electric Light Company has absorbed the Sprague Electric Motor Company. Mr. Edward H. Johnson, formerly president of the Edison Company, who retired and became president of the Sprague Company when Henry Villard was elevated to the presidency of the Edison Company, resigned, and Vice-President Herrick was made the temporary president of the Sprague Company, the change occurring Saturday of last week.

The Electric Club, New York.

The interest in this influential organization has increased with the New Year. A number of new members were elected at the meeting of the board of managers last week, and several applications have recently been made and are awaiting action.

Gen. O. E. Madden, the president, is taking hold of club affairs in his usual vigorous manner, and will no doubt be able to make a gratifying report at the regular meeting this week (Thursday), concerning the Club's financial condition and its future prospects. At this meeting Prof. Cross, of Boston, will lecture, and the attendants will be privileged to listen to an instructive and entertaining discourse.

Chairman J. C. Chamberlain, of the House Committee, announces that hereafter meals will be served at the Club house from 3 P. M. to 1 A. M., and new and tasteful *menus* have been provided, a copy being sent to each member.

Two new committees have recently been appointed by the board of managers as follows:

Library committee, Dr. Leonard Waldo, chairman; A. V. Garratt, and Henry C. Townsend.

Museum committee, Chas. Selden, chairman; Dr. Otto A. Moses and John J. Carty.

These are two important committees, and their *personnel* assures intelligent and thorough work. Members of the Club, who have books they would like to present the Club, or who have early and historic electrical apparatus, can now be assured they will be carefully cared for and placed where they can be seen by all interested in electrical matters.

Lack of Light Causing Crime.

When the Grand Jury of this city for the month of January was sworn in by Recorder Smyth, he made a statement which should be of interest to every citizen. In his charge to the jury the recorder stated that there were 86 prison cases, the majority of which were the result of crime because the city was not lighted during the past few weeks. It is scarcely necessary to comment on this statement. If every arc light is equal to one good policeman, as stated by the chief of police, then the thousands of arc lights which have been removed have lessened the protection of this city to that extent, and the statement of Recorder Smyth proves that the criminal element has taken advantage of the situation, one which has been brought about by incompetent and ignorant officials.

The Chimes by Phonograph and Telephone.

On New Year's evening Mr. J. Sullivan, of the Edison Company, with several assistants from the Metropolitan Phonograph Company, of this city, succeeded in getting two phonographs up in the belfry of Grace Church, with the object of securing impressions of the chimes which were to welcome in the new year. Their efforts were quite successful and several impressions were taken; one is to be preserved by the church, and another presented to Mr. Edison, the others to be used by the Metropolitan Phonograph Company.

The office of the Phonograph Company is 257 Fifth avenue, and here one of the phonographs was placed in front of the transmitter of a long distance telephone set, and was plainly heard by President Cheever, of the company, at his telephone in his downtown office, 13 Park Row. A number of visitors at Mr. Cheever's office enjoyed hearing the chimes as they were given out by the phonograph at the company's office some two miles away.

The Western Union Tax Cases.

In the United States Circuit Court a few days ago, Judge Colt heard arguments in the case of the Attorney-General of Massachusetts against the Western Union Telegraph Company, which comprises three suits to recover taxes assessed upon the defendant for the years 1886, 1887 and 1888, amounting to $40,862. The tax is what is termed a franchise tax, and the defendant contends that it is liable to be taxed only on its tangible property in the State. It also sets up other defences which were not raised in the case in which the United States Supreme Court decided that the State tax assessed in 1885 must be paid. Decision was reserved.

Telephonic News

⁂ An effort is being made to establish a telephone exchange at Denison, Texas.

⁂ A new Russian telephone service is about to be opened between the capital and Moscow, a distance of 400 miles.

⁂ The San Antonio and Arkansas Pass Telephone Company, recently organized, has opened its first commercial office at San Antonio, Texas.

The First Underground Telephone Cables in Hamburg.

The number of subscribers, which at the opening of the first exchange, seven years ago, amounted to 800, has increased so rapidly that the original locality occupied by the central exchange no longer suffices for the present traffic, there being now over 4,000 subscribers to the network. Arrangements have been made to remove the central exchange to the newly built District Post Office near the Stock Exchange, and to fit it up so as to accommodate 6,000 subscribers. The costs of this alteration have been estimated at £25,000. Female operators have been employed for some time at the Hamburg central station.

The laying of the first underground telephone cables was commenced at the beginning of last month by the Postal Administration, and will probably be finished within three or four weeks, weather permitting. Further cables will be laid in April for the connection of the various exchanges.

Telephone Between Buenos Ayres and Montevideo.

This line consists of a metallic circuit partly formed of overhead wires in the immediate neighborhood of the two terminal stations Buenos Ayres and Montevideo, and partly of a submarine cable immersed in the Rio de la Plata, where this latter has a width of 45 km. (90 km. altogether). The air line consists of stout bronze wire. The distances are: Buenos Ayres over La Plata and Ensenada to Punta Lara (air line), 112 km.; Punta Lara to Colonia (submarine), 45 km.; Colonia to Montevideo (air line), 155 km.

The total length of the line, inclusive of the 45 km. of cable, is not less than 300 km.

The line has been erected by a private company under the management of the engineer, Emilio Laborde, and is to be used both for telephonic and telegraphic purposes; it is provided with Van Rysselbergh's apparatus, manufactured by Mourlon & Co. (now Compagnie de Télégraphie et de Téléphonie Internationale), of Brussels. The cable and bronze wire were supplied by Felten and Guilleaume, of Mülheim-on-the-Rhine. Near Montevideo the bronze wires cross the river Santa-Lucia at a span of 420 m. on posts of 33 m. height.

The representatives of the Buenos Ayres and Montevideo press were present at the opening, and they all agree in their opinion that the transmission is at least as clear as in the Buenos Ayres urban network. They all point out with no small amount of satisfaction and pride that a similar line does not yet exist in Europe. The tariff is a remarkable one; during the busy hours of the day it is: For five minutes, $5; five to ten minutes, $12.50; ten to fifteen minutes, $25.

Electric Drink Dispenser.

Extract, Edinburgh *Scotsman*, October, 26, 1889: The new electric tap, which is on view at "The Breweries," at the Agricultural Hall, is evidently a "terror." If a thirsty one asks for "four of Irish," pushes a nob, turns a tap, and hi! presto, the four's worth is drawn off, neither more nor less. The same tap can deliver either the drop at a penny or a Niagara's worth at one and six. Moreover the amounts taken are registered on a dial for the owner's satisfaction.

The Circular of the French Administration of Telegraphs.

A circular has been addressed by Monsieur Coulon, the head of the French Telegraph Department, to the subscribers of the Paris network. It will be remembered, says *The Telephone*, that on the 1st September of this year, the French Government took over the telephones. Since that time numerous complaints have appeared in the public press, or at least one part of the press hostile to government administration, on the insufficiency and irregularity of the Paris telephone service. This same portion of the press now contends that in issuing the circular, Monsieur Coulon has given the administrator of the telephones a "*testimonium paupertatis*." We confess we do not regard the circular in this light. The government found it necessary, in order to improve the Paris service, to reduce the number of central stations, of which until lately there were 12; and it must be clear to any unbiassed observer that such a serious undertaking could not be carried out without in some degree interfering with the actual service. The circular very properly appeals to the patience of the public, and shows that all the necessary steps for insuring a regular and improved service, even during the period of necessary alterations, have been taken by the administration.

The National Telephone Company are doing exactly the same thing in London as the French Government in Paris—they are reducing the number of central stations with a view to a more efficient service. We have made, in our issue of the 15th October, page 470, the same appeal to the London public as has been addressed by Monsieur Coulon to the Paris subscribers.

The following is the text of the circular:

"The telephone subscribers are in the habit, whenever any delay or difficulty arises in telephonic communications, to charge the operators with carelessness or personal spite. Now, it may have occurred that some of the ladies employed at the exchanges have shown a want of consideration and a remissness in attending to the subscribers' calls. In such cases the administration is determined to punish these shortcomings with instantaneous dismissal. In most cases, however, the fault has to be sought for in another direction.

"The Paris installation consists at present of 12 district networks, each of which has its own central station. Each subscriber is connected to one of these stations by a special wire, and the different central stations are connected with each other by trunk lines. The mode of construction of the apparatus used for trunk line communications renders it necessary that, for the purpose of connection of two of these apparatus, four, and in some cases even six, operators should previously enter into communication. From this you will see that at present the trunk line service is very complicated.

"In order to remedy this defect it will be necessary to reduce the number of central stations. But to do this, first of all the requisite localities have to be found large enough to accommodate the staff and the apparatus; then arrangements must be made for simplifying the connections; and, further, many thousands of wires now lying in the sewers must be led to the new exchanges; and all this must be done without interrupting the present tariff.

"The administration will effect these alterations as fast as its resources will allow, but it ought to be understood that these operations cannot be carried out all at once and that time is required to accomplish such a task.

"Now, since it is impossible to reduce the number of connections to be made, the administration is going to employ a larger number of operators, in order to shorten the time necessary for making the connection. The new operators, however, must first be taught, so that this measure, too, will only prove efficacious after some time.

"I again assure you that I shall severely punish any operator who fails to do his duty. But to enable the administration to carry out this intention, I would urgently request you, in case you have to make any complaint, to state accurately the name of the desired correspondent, the time of the call, and the nature of the complaint.

"Finally, I have to mention that the apparatus in use at the present time are going to be considerably improved in order to simplify the service.

"We hope before long to establish in Paris a telephone service which shall satisfy all modern requirements.

"This statement, which I felt obliged to make, I hope will convince you that your legitimate complaints have been attended to, and I now have to request you to have patience and to allow our engineers the necessary time for remedying the existing defects."

A Backer Wanted.

A correspondent at New Haven, Conn., writes us with a happy disregard of spelling, that he has an "ide" of an invention on "prepectual motion," and wants to know if there is a "man in the United States who is willing to invest $500 or $1,000 to win or lose."

We have filed our correspondent's letter, and if any of our readers wish to venture in this field we can put them in communication with our sanguine correspondent.

Meeting of the Board of Electrical Control.

The meeting of the Board of Electrical Control, of New York, was held last week. The Mayor, and Commissioners Gibbens and Hess were present. The engineer of the Board, Mr. Henry S. Kearney, submitted a plan of subway work to be done in 1890, but in reply to questions from the Mayor, admitted that the work would require at least two years. It was learned that the map of the work ordered in 1887 had not yet been filed, and the Mayor expressed his indignation against the Board for such careless methods. Electrical expert Wheeler reported that there were 12,308 miles of wires now in operation in the subways, and also reported a list of dead wires and poles which he thought should be removed. Commissioners Hess and Gibbens were appointed a committee to confer with the electric companies with reference to this work.

The annual report of the Commissioners to the legislature was read also and adopted, although the Mayor refused to vote. He said that it contained statements about which he knew nothing, and reflections upon his predecessor, ex-Mayor Hewitt, which he could not approve.

The Commissioners report that "the responsibility for the condition of the wires in the city of New York is a dual one." They say that the providing of subways and making of regulations is the duty of the Board of Electrical Control, while the enforcement of such regulations is the duty of the Mayor and Commissioner of Public Work. The failure of this "division of responsibility" to prove "as successful and effective as was expected" is urged as an excuse for the delay in the burial of the wires. There have been constructed 73 miles of trench and 1,007 miles of duct, sufficient for 45,000 miles of telegraph and telephone wires and 2,000 of electric light wires. The condition of overhead wires is reported to be very bad, from 30 to 50 per cent. of them being unnecessary or "dead." It is suggested by the Commissioners that full power should be vested in one official or board to carry out the intent of the laws relating to electric wires.

The following comments in the daily *World* of this city are given as an illustration of opinion, showing the light in which the Board of Electrical Control is viewed by the daily press:

"The Board of Electrical Control has devised no system for underground wires, but has contented itself with indorsing the recommendations of the Phœnix Construction Company, which to all intents and purposes has provided the plans and built the subway. Favoritism has dominated the Board of Electrical Control throughout, and the Commissioners of the Board of Electrical Control have never earnestly sought such information as would have resulted in burying the wires. Not one of the three Commissioners could pass a civil service examination for an inspector even on the low plane they have established for such employés of their Board. These Commissioners are not only responsible for the wires not having been buried, but are also responsible to a large degree for the condition of the overhead wires.

"The alleged distribution system is not worthy of the name, but merely answers as another means of compelling the companies to pay toll to the Subway Company. No competent electrician doubts that an underground system is practicable and desirable, but no disinterested expert will assert that the Board of Electrical Control has provided such a system as the one man who understood his business (John P. Barrett) has given Chicago."

The True Inventor.

"A great and successful inventor is only a man who, groping for knowledge, 'touches God's right hand in the darkness and is lifted up' to broader views of the omniscience and omnipotence which belong alone to Him."—*Bishop Colton.*

The Investigation of the Electrical Industry for the Eleventh Census.

BY ALDEN R. FOOTE.

1. The investigation of the electrical industry, to be reported in the eleventh census, offers an opportunity of great value to ascertain the true importance that the practical application of electric energy has acquired in industrial and social development. This opportunity should be made use of to the fullest extent possible. In all departments of endeavor, an exact knowledge of existing and antecedent conditions is the necessary base from which to direct future action. Laws and actions based on assumptions, instead of ascertained facts, are the pitfalls of civilization. Whose action is not in accord with fact, though it be unknown to him, must pay the penalty of ignorance through the lost cause by his inevitable error. A business policy guided by ascertained facts cannot fail.

2. Some managers of electric lighting and power stations have intimated to us that there are certain features of their business concerning which they do not desire to answer inquiries. They have acknowledged, at the same time, however, that information regarding those very points, if given by other companies, would be more valuable to them than any other data that can be obtained. So strong is the repugnance of some persons to the invasion of what they consider their private affairs, that sworn agents of the census frequently find it difficult to obtain the information to which they are legally entitled. I believe the policy of secretion on the part of any individual to be a mistaken one, adopted either under a misapprehension of the facts or an ignorant view of his own interests. It may be stated as a fact that no person will be benefited more by the publication of an absolutely truthful statement, showing the operation of every company in the United States engaged in his line of business, than that person who doggedly refuses to answer inquiries, or retards the publication of the information to be collected by dilatory compliance with the requests sent him. A just punishment for his illogical selfishness would be to make his self-imposed isolation still more impenetrable by debarring him from receiving any benefit whatever from the information given and work done by others. Such a person should be compelled to live where there are no mails, newspapers, railroads, telegraphs or telephones.

3. Information given to an agent of the census cannot be used to the injury of the giver. The interest of the government can be served only by protecting the interest of the individual. Every agent is sworn to secrecy and is under as strict supervision as are the national bank examiners. Every publication of the information obtained is absolutely impersonal, so that it cannot possibly be traced to any individual or company, unless it should happen that but one person or company is employed in the occupation described. While these regulations offer protection to the individual, they, at the same time, offer him, in full and equal exchange for the information he can give, all the information obtained from every person in his line of business. The exchange is as a thousand for one. A consideration worth an hundred times more to any other person or company than the cost of the effort they are required to make to obtain it.

4. In no department can the benefits that a citizen may derive from well-organized and intelligently directed governmental action be better exemplified than by the operations of the census office. The main features of the industrial information wanted are plain statements of facts, which any well regulated business concern can furnish easily and promptly, from the accounts kept by themselves for their own advisement. To provide for the lack of uniformity in accounts, and to inform all persons interested as to what inquiries they will be expected to answer, schedules are furnished months in advance of the date on which the information is wanted. This enables each concern so to keep account of their items that on the day from which the information must bear date, an accountant can easily fill up the entire schedule and mail it to the census office. The advantages to be gained by individuals and companies in doing this are a most generous return for so simple and easy an undertaking on their part.

5. The magnificent exhibition of co-operation with the government that would be shown by simultaneously mailing a properly filled schedule to the census office on the same day by every company or person interested in the electrical industry, would mark the advance line of progress in census taking. Those who are placing this great agent of power, electricity, at the service of every citizen and municipality, by doing so will but sustain their well merited title of "Lightning Engineers." Really, it is but a simple thing to do. It only requires that each one shall demonstrate himself to be the peer of the sun in his ability to do things on time. All things done require time for their doing. It requires no more effort to do a thing at a proper time than to do it at any other time. Who so

orders the doing of them that each is done when required, liberates himself from the law of necessity and makes himself master of circumstances. All that is required in this case is that each company shall designate an officer or employé as the person who will furnish the information desired by the census office, and hold him responsible for having it ready on the mailing date.

6. The lack of information that may be obtained through the census report has been felt so keenly that no less than 10 individual attempts, by as many central station companies, to gain some part of it have come under my observation during the year 1889. These attempts have been expensive to their originators and troublesome to those to whom they have made their appeals. Worse than this, they have been unsatisfactory, because too limited in the scope of their inquiries; and dangerous, because they have not covered all the factors necessary to a correct statement. Public or private action based on insufficient data can but be ill-advised and disappointing. Such disadvantages may now be overcome with the greatest ease, to the injury of none and the advantage of all, if each person in interest will promptly and fully supply his own quota of census data.

7. It is not the business of the census office to report or to prove the correctness of theories. It is its business to report facts. No person should be so eager to know facts as the man with a theory. If the facts are with him, he will be enormously benefited by their helpfulness. If they are against him, a knowledge of them may save him disastrous loss. No man ever attained a success by remaining ignorant of the facts pertaining to his occupation. The electrical industry is so young it is almost too soon to attempt to separate the experimental from the practical. No feature of the wonderful progress made, which may now be recorded, is removed from its experimental stage by so much as a single decade. In view of this, it will be well to take notice of every experiment that is now being practically tested. Such a record will possess great interest for those who may be privileged to compare the results of the eleventh with those of the twelfth census. The experiments of to-day will furnish the best landmark for the progress to be recorded in 1900.

8. The report of the investigation with which I am intrusted will be the first official chapter in the history of the practical application of electricity to the uses of light and power. I do not assume the ability to write a report that shall be perfectly satisfactory to the 65,000,000 critics in the United States, not to mention those in foreign countries, to whom my work must be submitted. What I shall do, is to give every person who shall criticise me adversely *after* my report has been published, a good opportunity to place himself on record, by making suggestions to me while the work is in condition to be benefited by them. No more time will be required to write a suggestion before, than to write a criticism after the work is finished, *but much greater genius.* The wisdom of foresight is a far more rare and valuable gift than the wisdom of hindsight. To look ahead to an objective point, and form plans which, if followed, will make one sure of getting there, is a work of immeasurably greater value than to look backward and tell how present conditions came to be so. The historian of events, real or imaginary, can never be a reader. Who declines to suggest, deprives himself of the right to criticise. Through the courtesy of the electrical press, I urge every one interested in the electrical industry, each from his own point of view, to suggest to me every item of information that, in his opinion, should find a place in my report, together with his idea as to how it may be most easily and correctly obtained.

9. In my opinion, the facts to be reported form two distinct classes:

First. Facts of the present value, the full benefit of which will be realized at the time of publication.

Second. Facts having a future value, the full benefit from which will be realized 10 years hence, when comparisons will be made between the results shown by the eleventh and twelfth censuses.

10. There are a multitude of facts of very great value to those directly interested in the industry, that have no value to the general public, except in an indirect manner. The collection of such facts will be limited by the voluntary co-operation of those to be benefited in supplying them. I shall be greatly disappointed if there is any failure in this regard, especially since Hon. Robert P. Porter, superintendent of census, has invited such co-operation in the following terms:

"It is the purpose of this office, without seeking data which may be irrelevant or unimportant, to make the statistics of this industry complete and accurate, so that its real condition and true importance may be known and understood by the general public. It is confidently believed that those who are to derive the chief benefit from the result of the inquiry, viz, manufacturers and central station companies, engaged in the distribution of electric currents for the commercial uses of light and power, will lend their cordial aid to render that result full and reliable. A formal response to the questions of the schedule is all that can be insisted upon, but the superintendent solicits beyond this the hearty co-operation of all persons interested in respect to furnishing information promptly and accurately, in the procurement of additional facts, and in the suggestion of pertinent and useful lines of investigation. Without such co-operation intelligently supplied, the inquiry must of necessity be limited in its value.

"The census of 1880 makes no mention of the industry of generating and distributing from central stations electric currents for the uses of light and power. The investigation of this industry for the eleventh census will be the first official census report made on the subject in this or any other country. For this reason it is particularly desirable and essential that the investigation shall not only present a record of the industry as it exists to-day, but that it shall so classify and arrange the information as to render it serviceable as a basis for present action and of comparison for all future reports. In view of these facts, the importance and value of such an investigation and the official publication of its results should in itself be sufficient to secure from every person addressed a special effort to answer fully and promptly every inquiry. The exhibition of the birth of an industry, and its growth to the magnitude of an interest second to none in importance within the short space of a single decade, is a marvelous record of progress. In no other industry and in no other country has such a record ever been made."

An Electric Holiday Celebration.

On Saturday evening, Dec. 28th, says the Adrian, Mich., *Times and Expositor*, the large plant of the Gilliland Electric Company was lighted from top to bottom with the gleam of hundreds of incandescent electric lamps, and from out the brilliant light came sweet music and the noises of innocent revelry.

The company had taken the occasion to celebrate the holiday season, and "warm" the new shop building by giving their employés and many friends a grand ball, with all its accessories. Hunt's orchestra furnished the music; and there were present nearly 300 guests—including a number from New York, Chicago and other cities.

Refreshments were served in the room that is to be used as the finishing department, where were also stationed two phonographs that furnished no end of amusement for all.

The order of dancing contained 21 numbers, and Sunday had already begun as the guests went homeward. It was one of the most enjoyable occasions of the season, and was managed with the success which characterizes the more serious undertakings of the company.

SOUTHERN ELECTRICAL NEWS.

Wilmington, N. C., will be supplied in a few days with the Thomson-Houston system of arc and incandescent light.

Macon and Suburban Street Railway, Macon, Ga., have started operation with the Thomson-Houston system, a large patronage, and giving entire satisfaction.

The Sub-Tropical Exposition at Jacksonville, Fla., are placing a plant of 50 arc lights, Thomson-Houston system.

The Columbus City Council, of Columbus, Ga., awarded the contract to the Thomson-Houston Electric Light Company for 600 lights last week.

Waycross, Ga., Jan. 1st.—At midnight, at the opening of the new year, the city was brilliantly illuminated for the first time by the arc lights of the Thomson-Houston system. The current was turned on by the hand of the little daughter of the manager and proprietor, Mr. Albertson.

The Thomson-Houston Company report a large increase in sale of supplies in Atlanta office.

The Georgia Electric Light Company, of Atlanta, will at an early date greatly increase their installation.

Rome, Ga., has installed the Thomson-Houston system of series incandescent street lighting, and started Xmas Eve, Mr. G. M. Chamberlin of the Atlanta office in charge.

Atlanta, in proportion to her size, says Mr. Woodward, chairman of the committee on lights, is probably the best lighted city in the world. During the past year a vast amount of work has been done by the committee on lights; 17 new arc lights have been put up, 105 sixty-five candle-power lights, and about 35 thirty-two candle-power lights put in, and 94 have been displaced by larger lights. These lights, as well as all the electric lights in the city, have been put up with regard to necessity for them, and are evenly and wisely distributed.

Mr. D. H. Mullenix, manager of telephone exchange in Macon, and Mr. Joseph Waxelbaum, have been appointed agents for the Georgia Phonograph Company in that district. F. E. C.

Atlanta, Ga., Jan. 7, 1890.

ELECTRICAL PROGRESS.

To the Editor of Electrical Review:

Progress as regards principles is necessarily slow, for the reason that man is too prone to work and apply known principles as far as possible, rather than seek for new ones to achieve results. It is largely to this, however, that we are indebted for the gigantic strides for which the present age is so justly famous. But these fields are beginning to be overdrawn; already inventions are beginning to overlap on each other. New combinations and new applications of old principles are put to work to produce new results. It is invention if you will, and progress in the popular acceptance of the term, but it is far from real progress. This is equally true in electrical matters. The impulse given by the grand researches of the master minds of the present century is beginning to wear out.

It is not merely necessary that we should apply existing facts, but that we should seek for new ones to give an impetus to the progress of art. The possibilities in that line are wonderfully great. Not that the present age is backward in discoveries, but we must dip deeper to achieve what we have staked out. The signs of the times point to greater improvements and steps towards perfection. The pride of Lucifer dominates the mind of man as his knowledge approaches the infinite. It is not enough to stand thus idle, we must go on faster.

Before the world is many years older electricity will be our servant in all things. When principles are discovered, reversibility is often found attendant on them. A great number of results are achieved by some intermolecular or inter-atomic action. Electricity is a wave motion or progression of atoms, and is capable of almost every power of mutation. It remains only for us to discover the means of applying it to our ends. Under electrical action the atoms appear to release the old bonds and acquire a power of taking up new ones. In the banding together all affinities seem to be destroyed, and we can in some instances direct the resulting action. If electricity can tear down, why can it not build up?

The diamond, as is well known, is merely an allotropic form of carbon. Why can we not take charcoal and electricity, disengage the atoms from each other, and submit them to a rectifying process, and build them up with new bonds and affinities for each other to form a diamond? It is merely a question of localization. We can take a diamond and unite the same particles with a slight loss by oxidation to produce charcoal. Is a reversal of the process impossible?

Electricity can produce a variety of atomic changes. It can, by electro-deposition, convert an amorphous metal into a crystalline. It can, by some mysterious action on a compound (electrolysis), separate from each other the constituent elements. In the refining of sugar we have only to eliminate the impurities, only to make the objectionable atoms to travel out of the compound. The other problems of the day are equally capable of solution.

Aerial navigation is a remote possibility. We must not look alone to the development of the storage battery. We are not dependent upon the solution of the problem of obtaining the greatest permeability in metallic plates for the wings of our Pegasus. Self-motive capacity is not a necessity. Means will yet be found for controlling from the earth a metallic vessel, and directing it hither and thither. Swift's dream of the flying island of Laputa will yet be realized. The aerial voyage of Lemuel Gulliver is not impossible.

The alternating current is doubtless destined to play an important part in the electrical progress of the future, on account of the extreme flexibility of the system. As it becomes established that electricity is allied to the other phenomena of the states of matter, we must look to our present knowledge of the other forces and analogy will supply much. The solution of the bewildering daily problems is not ungraspable. No man can say what we will not yet achieve in this line.

Geo. E. Morse.

Washington, D.C., January 10.

Electricity in the Navy.

There is a proposition before Congress to appropriate $250,000 to pay the cost of experiments to test the utility of electric motors as applied to the steering, lighting and ventilating of naval vessels; for pumping and hoisting, and for handling marine ordnance and ammunition, and generally to testing the efficiency of electrical power as applied to marine architecture. These experiments are to be conducted under the direction and control of the Secretary of the Navy, who is authorized to detail officers and designate places and vessels for the work. The act will be in force from the date of its passage, and the results of the experiments are to be reported to Congress. The bill particularly mentions the "Sprague electrical system of motors" as that to be tested, but gives the Secretary of the Navy power to investigate any other system, so that the department will be able to avail itself of any advantages which may be offered if the bill should be passed.

TELEGRAPHIC

.... In the suit of the Western Union Telegraph Company against W. H. Bush, of Philadelphia, Pa., to compel the latter to pay his subscription to the capital stock, which has formed the ground of a stubbornly fought legal battle, the Appellate Court of Illinois has decided in favor of the company.

.... At Lowell, Mass., at a special meeting of the Board of Aldermen, held Saturday night, the mayor and committee on police were instructed to contract with the Gamewell Company, of New York, for the introduction of a police signal system in this city, at an expense not to exceed $5,000.

.... At the annual meeting of the Northern Telegraph Company, recently held in Manchester, N. H., ex-Governor Frederick Smith, Col. John B. Clarke and William F. Head were chosen directors, and Charles H. Bartlett, clerk. A four per cent. annual dividend was declared. The line is leased to the Western Union.

.... The Western Union Telegraph Company is now engaged in building six new wires out of Macon, Ga., as follows. Two to Atlanta; one direct to Jacksonville via Georgia Southern and Florida Railroad; one to Jacksonville via Thomasville; one to Columbus, and one to Eufaula. There are now 31 wires leading out of Macon.

....The Clinton Perpetual Telegraph Company, Clinton, N. J., is incorporated. It has elected the following board of directors and officers: President, Herman E. Gerhart; secretary and treasurer, Jos. Stryker; general manager, J. Madden; assistant general manager, H. Apgar; superintendent construction and repairs, J. Altemus.

.... The Canadian Pacific Company has completed its telegraph line between Montreal and Canso, where direct communication is made with the direct Atlantic cables of the Commercial Cable Company. This gives the Canadian Pacific direct cable connection throughout Canada. It will greatly reduce the time of transmission between the Old and New Worlds, on Canadian, Pacific Coast and general American business. Hereafter cablegrams from San Francisco, Portland, Seattle and Tacoma for Europe will pass over this line instead of going via New York, thus providing a more direct route to Europe.

....Everybody believes that Franklin was the inventor and constructor of the first lightning-rod. In this one particular everybody is mistaken. The first lightning catcher was not invented by the great philosopher, but by a poor monk of Seuttenberg, Bohemia, who put up the first lightning-rod on the palace of the curator of Preditz, Moravia, June 15, 1754. The name of the inventive monk was Prohop Dilwisch. The apparatus was composed of a pole surmounted by an iron rod, supporting 12 curved branches and terminating in as many metallic boxes filled with iron ore and enclosed by a wooden box-like cover, traversed by 27 iron-pointed rods, the basis of which found a resting place in the ore box. The entire system of wires was united to the earth by a large chain. The enemies of Dilwisch, jealous of his success, excited peasants of the local ty against him, and under the pretext that his lightning-rod was the cause of the excessive dry weather, had the rod taken down and the inventor imprisoned. Years afterwards, M. Melson used the multiple pointed rod as an invention of his own.

A Stock Quotation Telegraph Company.

The certificate of incorporation of the New York Quotation Company, with a capital of $500,000, has been filed with the Secretary of State. The company is formed for the building of telegraph lines throughout New York City, and to cities and villages in and outside of this State from the several exchanges in New York. The incorporators and stockholders are William H. Baker, Theodore L. Cuyler, Jr., of Brooklyn, and John O. Stevens, of Plainfield, N. J. Mr. Baker owns 4,980 of the 5,000 shares of stock, and Messrs. Cuyler and Stevens hold 10 shares each.

* * The Americus, Ga., Electric Street Railway was completed on the 5th inst., and the cars are now making regular trips with good success.

* * The Milford, Mass., Electric Light and Power Company will add to its plant a 1,000 volt alternating dynamo, for long distance lighting.

* * Four new electric cars, supplied with incandescent lamps and stoves for heating, have been placed on the new railway at Salt Lake City, Utah.

* * The Boston *Post* thinks that the bookkeeping of electric light companies must be very simple, all their expenditures being put down to current expenses.

* * The Consolidated Street Railway Company, which is now constructing tracks in the streets of Toledo, O., will probably use electric storage battery cars.

* * The annual meeting of the Edison General Electric Company will be held in this city, Monday, January 20th. Mr. A. Marcus is secretary of the company.

* * The West End Street Railway Company, of Boston, will soon establish an electric plant at East Cambridge, where they have bought a lot of land for the purpose, costing over $125,000.

* * The Anglo-American Electric Light Co. of New Britain has purchased the Peck, Stowe & Wilcox shops in Kensington, Mass., and will make there the Sorley storage battery. The works will be started about the last of January.

* * The Milwaukee City Railway Company has asked permission of the Board of Public Works to begin the work of converting the line into an electric road. The work will be pushed until cold weather compels a cessation, and will be resumed in the spring.

* * The West End Railway Corporation, of Boston, Mass., has recently purchased the property of the New England Glass Works in East Cambridge, where they will erect electrical works for the supply of the Cambridge and Somerville district equipments.

* * Lincoln, Neb., has 35 miles of street railway operated by horses, with the exception of one line to West Lincoln, which is operated by steam motors. Here is a good opening for a change of motor power to electricity, which move would be met with favor by the citizens of Lincoln.

* * A charter has been granted the Boyd Street Railway Company, of Pittsburgh, Pa., to construct an electric railway at that place. The incorporators are Joseph W. Wilson and Joseph Mitchell, of Pittsburgh, W. W. Murray, of Knoxville, H. T. Rowley, of Wilkinsburg, and S. S. Robertson, of Allegheny.

* * The Bangor Electric Light Company's new plant at Veazie, Me., has recently had made by the Holmes Works, Gardner, Me., a huge water wheel, which is said to be the largest ever cast in the State. It is about 10 feet in diameter, and will weigh a little over 3,500 pounds, and is ⅝ of an inch in thickness.

* * According to a German exchange, the number of electric railways in Europe at the end of last year was 11, of which the oldest, the Lichterfelde-Berlin railway, was opened in 1881, being one and one-half miles in length, with one motor and car, and carrying yearly 100,000 passengers. The latest is that opened in Brussels last year, with five motors and cars.

* * The board of Aldermen, of Shelby, N. C., has ordered an election upon the question of issuing $1,800 in bonds to have the town lighted with the electric lights. The Westinghouse Electric Company of Pittsburgh, have agreed to light the town for three years for $600 per year, provided the contract is made for three years. The election will be held on Monday, February 10, and, it is believed, will be carried in favor of the light.

Novel Advertising.

Sunday morning the people of Boston were astonished at seeing placards about two feet square, advertising a new attraction at one of the theatres, suspended from the span wires supporting the trolley wires on all the electric railway lines. The work had been done during Saturday night, whether or not with the consent of the railway company is unknown.

Resuming Business Promptly.

The Edison Electric Illuminating Company, of New York, whose Pearl street station was entirely destroyed by fire on January 2d, 1890, turned on current and resumed service to all of its customers from this station as rebuilt, Monday, January 13th, and will continue from that time to serve all its customers without interruption. This company issued a circular thanking its down town customers who may have been incommoded by the interruption of the current, for their forbearance, and stating that the station destroyed was the only station owned by the company that is not absolutely fire-proof, and it is to be replaced by a fire-proof station during the coming season.

* * The cable railway construction last year in Kansas City, Mo., aggregated 30 miles, bringing the total cable railway mileage up to 71.5 miles. The total street railway mileage of that city is 135.5 miles. The rapid transit lines represent an investment of $1,500,000, and employ over 1,000 men. Franchises have been granted for the building of 20 miles of road, in addition to the large mileage now in successful operation.

* * The Central Electrical Construction Company, of Philadelphia, Pa., has been absorbed by the Leonard & Izard Construction Company, representing the Edison people at Chicago. The purchasers will within a few days establish a St. Louis department in connection with the Edison agency, of which A. H. Reece is the general manager. Mr. Reece will be assisted by E. F. Horn, who accepts the position of superintendent.

* * A meeting of the Norristown, Pa., Electric Light and Power Company was held at their office a few days ago. The following officers were elected for the ensuing year: President, Joseph Shaw; vice-president, I. H. Brendlinger; secretary and treasurer, W. F. Solly; board of directors, Joseph Shaw, I. H. Brendlinger, George W. Smith, James McGinnis, J. Morton Brown, Isaac W. Smith, John Slingluff, Samuel S. Kohn, Philip Quillman, W. F. Slingluff, J. Evans Isett.

* * At a meeting of the stockholders of the Allegheny County Electric Light Company, Pittsburgh, Pa., held recently, it was decided to increase the capital stock to $1,250,000, the excess to be issued as the directors of the company may see fit. A statement read showed the net earnings of the last month to be $30,000, or 12 per cent. on present capitalization. The number of arc lights now in use shows 224 per cent. increase over that of a year ago. The increase in capital stock is to cover the expense of betterment of plant.

* * The Westinghouse Electric Company has now entered the field of supplying electric machinery for mining purposes. A few days ago the company secured a very large contract from the Hercules Mining Machine Company, of Pittsburgh, Pa., for a large quantity of motor generators and Tesla motors. This apparatus is to be used to operate the Hercules coal mining machine, a new device, which has lately been brought out by the Hercules Mining Machine Company. The Hercules is said to possess the ability of producing coal on a more economical plan than any similar contrivance. The inventors of the Hercules have been testing a number of electric motors as to their ability to operate the machine. The result of these experiments ended favorably to the Tesla motor. The Hercules is being introduced in all the different coal mines of the Monongahela valley, and, as a Tesla motor goes with each Hercules, the Westinghouse Electric Company is to be congratulated on securing the contract.

Invitation of the Chicago Electric Club.

The following handsomely printed circular letter has been sent out by Secretary Garratt from his office at 18 Cortlandt street, New York:

To Eastern Members of the National Electric Light Association.

GENTLEMEN:—Iam in receipt of an official communication from Mr. W. A. Kreidler, secretary, inviting the Eastern delegates *en route* to the Kansas City Convention of this Association, to accept the hospitality of the Chicago Electric Club on Monday, February 10th. I have accepted this very courteous invitation on your behalf.

You will receive under separate cover a communication from Mr. Clarence E. Stump, chairman Transportation Committee, giving full particulars relative to the special electric limited Pullman train, which will be run for the accommodation of delegates and their friends, from New York to Kansas City, leaving New York Sunday morning, remaining in Chicago on Monday, and arriving in Kansas City Tuesday morning. You are earnestly requested to promptly respond to the above named communication, and thereby enable the New York Transportation Committee to carry out their somewhat difficult task to the best advantage.

Delegates from New England will communicate with Mr. Fred. A. Gilbert, of Boston, who is chairman of the New England Transportation Committee.

The New Hampshire Electric Light Association—The Fifth State Organized.

The central station companies of New Hampshire held a meeting to organize a State association, Thursday, Jan. 9th.

The response to the call for the meeting was almost unanimous. Nearly every company in the State was represented either in person or by letter. A careful estimate showed that over 80 per cent. of the capital employed in central station lighting in the State was represented in person.

The desirability of organizing a State association was fully discussed and the proposal to organize at once was cordially endorsed.

The organization was effected by the adoption of by-laws and the election of the following officers:

President, Alonzo Elliott, Manchester.

Vice-president, F. W. Eastabrook, Nashua.

Secretary and treasurer, Edgar Woodman, Concord.

Executive committee: Alonzo Elliott, Manchester; F. W. Estabrook, Nashua; H. W. Burgett, Dover.

A resolution was adopted directing the secretary to send an invitation, with a blank application for membership, to every central station company in the State.

The meeting was held in one of the handsomely furnished parlors of the Manchester House, which has been open but a few weeks.

After the adjournment of the meeting, President Elliott's invitation to partake of a dinner, laid in the handsomely equipped hotel dining room, was gladly accepted.

PERSONAL.

Mr. Philip S. Dyer, of Antwerp, Belgium, European representative for the Edison interests, is visiting New York. Mr. Dyer will return to Antwerp next week.

Mr. Chas. Selden is now assistant to the president of the Baltimore & Ohio Railway Company. Mr. Selden's assistance in any cause is most valuable, and the president is to be congratulated, as well as Mr. Selden, on this deserved promotion of an able official.

Mr. H. L. Bancroft, of the Bridgeport Copper Company, died of pneumonia, in Washington, January 10. Mr. Bancroft was very highly esteemed in electrical circles, and was a gentleman who numbered his friends by the score. On New Year's day he was married to Miss Virginia S. Migeon, of Torrington, Conn., and in 10 days the happy bride became a heart-broken widow. Mr. Bancroft's brother and sister reside in Lynn, Mass.

Four new dynamos, having a total capacity of 2,500 lights, have been added to the plant of the Winnipeg, Man., Electric Light Company.

GENERAL ELECTRICAL NEWS.

Telephone connection is established between Sedalia and Kansas City, Mo., and the line is thrown open at rates less than those of the telegraph company.

The wires of the new Commercial Union Telegraph Company, of Maine, are completed, and a connection has been made with the system of the Canadian Pacific Railroad.

The plant of the Chippewa Falls, Wis., Electric Light Company has been purchased by W. H. Phelps, of Minneapolis, president of the Water Works Company in Chippewa Falls.

A telephone line will be constructed in Arkansas, from Stutegart to Altheimer, and then into Little Rock along the line of the Altheimer branch of the St. Louis, Arkansas and Texas Railroad.

A franchise has been granted the Central Electric Light Company, to construct poles and wires and maintain an electric plant in that place for a term of 50 years; also to light the streets for two years.

The Atlantic Telegraph Company held its annual meeting at the Falmouth Hotel, Portland, Me., recently, and the following officers were chosen: President, J. W. Deering; clerk, N. D. Pratt; treasurer, J. J. Donovan.

Work has been commenced on the placing of an electric plant in the new power house of the Second Avenue Electric Road at Soho, Pa. Two 200 h. p. engines will be employed to run the dynamos. The Thomson-Houston system will be used.

The Salem (Mass.) Electric Light Company has provided a library of works upon electricity for the benefit of its employés. This is an excellent idea, and should be followed by every company which has the interests of its employés in view.

The Victoria (Texas) Electric Light Company have about completed work on their lines, and expect to be able within a week or 10 days to commence operations. Most of the business houses of that city will henceforth be lighted by electricity as well as a large number of the residences.

The Congaree Gas and Electric Company's contract with the city of Columbia, S. C., for 100 twenty candle-power incandescent street lamps begun with the new year. Master Beverly Sloan turned the lights on by pulling the switches. By this contract the city gets 18 more street lamps, two arc lamps, and saves $600 over last year when gas was used. The lights have met with entire satisfaction.

Through the San Francisco *Examiner* we learn that the electric light first made its appearance in San Francisco in 1878, and was exhibited at the Palace Hotel of that place. Since that time the electric light has assumed vast proportions there, nearly $1,000,000 being invested in the plant at the present time. Arrangements are now being made to introduce incandescent light, to the number of 10,000, using the alternating system.

A meeting of the Toledo (Ohio) Electric Light Company, resulted in the election of the following directors and officers for the ensuing year: Edward Wilson, New York; L. S. Baumgardner, N. C. Stevens, G. G. Hardley, J. S. Rodgers, F. B. Dodge, J. H. Doyle, A. W. Scott and C. F. Jones. The old officers were re-elected as follows: President, Edward Wilson; vice-president, L. S. Baumgardner; secretary and treasurer, F. B. Dodge; manager, N. C. Stevens.

Catskill, N. Y., will have a novel system of fire alarm boxes. The village will be divided into five districts, and in each district will be located an alarm box connecting with the electric light building, on which a powerful alarm whistle will be placed. In event of a fire, it is only necessary to break the glass front of the alarm box, which will give the signal at the station in which district the fire is located, and the man in charge will give warning by blowing the whistle several minutes, after which he will give, in blasts, the number of the district.

Sir William Thomson's New Inspectional Electric Instruments.

We are indebted to our esteemed contemporary, the London *Electrical Review*, for the following interesting account of these instruments:

"The magneto-static current meter consists essentially of a small steel magnet or system of magnets suspended in the center of a uniform field of force due to two coils, each having one or more turns of copper ribbon or wire, and also under the directive influence of two systems of powerful steel magnets. The suspended system of magnets is attached to one end of a vertical shaft passing down centrally through an opening in the sole plate of the instrument from an indicating needle. The two systems of directive magnets are circular in form, and each ring is composed of two semi-circular magnets placed in a brass cylindrical frame with their similar poles together. Each system is securely fixed to a circular brass frame, which fits on to the cylindrical case of the instrument in such a manner that the systems are capable of being turned round, together or separately. The instrument has a 'tangent scale consisting of 100 divisions,' which is adjusted in its position before the instrument is sent out, so that the needle indicates equal differences of readings for equal differences of current.

"The instrument has an advantage, important for some practical purposes, of being available as an accruate direct-reading current meter, through a continuous range of from one to 100 times its smallest current, which may be anything from half a milliampere to four amperes, according to the number of turns in the coils supplied with the instrument. It is not, however, available as an alternate current instrument, and it must be remembered that the magnetism of the steel directing magnet does not remain *absolutely* constant. With good quality of steel, a proper preliminary *ageing* of the magnet (by heating it several times in boiling water and cooling it again, and subjecting it to somewhat rough usage) brings it to a condition in which its magnetism is found to remain exceedingly nearly constant month after month and year after year. Still it should never be relied upon as *absolutely* constant, and for laboratory work it is therefore necessary to have some means of retesting the instrument at any time. Another advantage which the instrument has is that, when a standard instrument is available, its constant is capable of being varied to any desired value down to one-tenth of what it has with its directive magnets in their strongest position. Thus if the constant should be three amperes per division of the scale, with the similar poles of the magnets coinciding, it may be adjusted to any value down to 0.3 ampere per division. The two grades of this instrument which are found most convenient are: The milliampere-meter, which has an effective range of from .3 to 300 milliamperes, and is usually adjusted to read two milliamperes per division, and the ampere-meter, which has an effective range of from .3 to 300 amperes, and is usually adjusted to read one ampere per division. One very convenient use of the latter instrument is to act as a lamp counter for indicating the number of incandescent lamps in an instal lation. For this purpose it is best to standardize it by putting on a known number of lamps and adjusting by the magnets until the desired reading is obtained on the scale. Of course this numbering of lamps is not possible to any great accuracy, because the lamps themselves are not all rigorously equal in the amount of current which each takes, but the lamp counter serves the important practical purpose of showing at any time the number of lamps in use nearly enough for practical purposes. The milliampere-meter, on account of the low resistance of its copper coil—about 40 ohms—may conveniently be used as a voltmeter. To adapt it for this purpose a copper cylinder, wound anti-inductively with two platinoid resistances, is supplied. The first of these, together with the resistance of the instrument, makes up 100 ohms, and the second alone is 900 ohms. Thus, taking the constant of the instrument at two milliamperes per division, by joining in series with the instrument, the reading on the scale will be $\frac{1}{10}$th of a volt per division; with both resistances in series with the instrument the reading will be two volts per division.

The ampere gauge is of simple construction, having a vertical base-plate of paraffined marble, to which are attached:—(*a*) A solenoid of special form; (*b*) brass bearing plates supporting a balance which carries a soft iron plunger on its one arm and a brass counterpoise weight on the other; (*c*) a brass arc having a scale graduated to give direct readings in amperes; (*d*) a hinged arm which bears a light checker. The solenoid is built up of copper plates with mica insulation between them, and is fixed to the plate so that its core is vertical. The balance is supported on knife edges at such a distance below the solenoid that the top end of the plunger is slightly entered into the core. The plunger is made from a thin soft iron wire about 20 centimeters long, and is supported by a cross-bar with two hooks on it, which pass over two knife-edge stirrups on the arm of the balance. It has a brass weight hung on its lower end in order to keep it in a vertical position and prevent its being attracted against the side of the solenoid. An indicating needle, or pointer, formed from a strip of platinoid, passes down from the trunnion of the balance to the brass arc bearing the graduated scale. As the plunger is attracted upwards this pointer passes round the scale and indicates the strength of current passing through the solenoid.

Several types of the ampere gauge are made covering a range from 0.5 to 500 amperes, and are available as measurers of electric current on either direct or alternating circuits. They are standardized by direct comparison with Sir William Thomson's standard electric balances, and when the instrument is intended for alternating currents, the graduation is made to suit the period of alternation in use on the circuit for which it is desired.

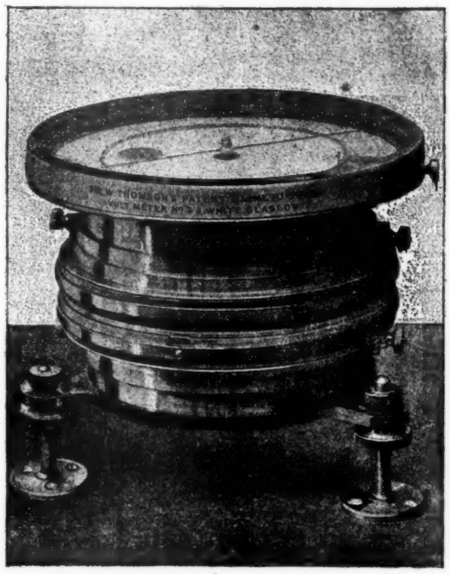

FIG. 1.—MAGNETO CURRENT METER.

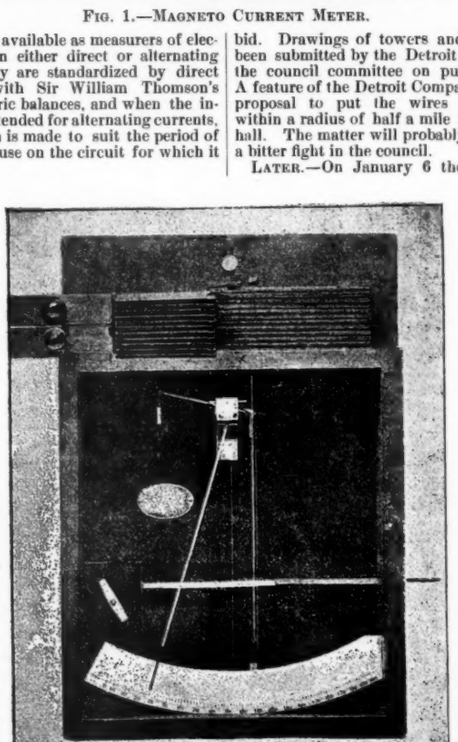

FIG. 2.—AMPERE GAUGE.—SIR. WM. THOMSON'S.

Automatic Safety Device.

In the event of an electric light wire breaking or becoming disconnected and falling upon other wires, or upon the ground, or upon persons or animals, or coming in contact with any conductor of the electric current, or with combustible material, if this new automatic safety device is in use it renders the broken wire perfectly harmless. The instant the wire separates, the electric current is shut off by this device, and at the same instant the dynamo ceases generating and remains so until the line is repaired and the automatic safety device is again placed into its proper position to work when needed. This device is the invention of Ernest P. Clark, electrician of the Clark Electric Company, of New York.

The Detroit Lighting Contract.

What the newspapers call a "pretty fight" has developed between the Brush Electric Light Company and the Detroit Light and Power Company, to determine which company shall light the city of Detroit during the next three years. The Brush Company has had the city contract for some years, using the tower system. Their contract expires July 1 next, and the Detroit Company offer to perform the same service for the ensuing three years for $98,000 a year—about $9,000 less than the Brush Company's bid. Drawings of towers and lamps have been submitted by the Detroit Company to the council committee on public lighting. A feature of the Detroit Company's bid is the proposal to put the wires underground within a radius of half a mile about the city hall. The matter will probably give rise to a bitter fight in the council.

LATER.—On January 6 the city council awarded the contract for the public lighting for three years following July 1 next, to the Detroit Electric Light and Power Company. The Brush Company has secured a temporary injunction which sets forth that the Detroit Company's bid is illegal, because not accompanied by drawings and specifications, and that if the city executes the contract it will be sued for infringement on the rights of the Brush Company covered by letters patent. A long legal fight is in prospect.

Detroit, Jan. 11, 1890. W. E. B.

—— The electric light is now being used in illuminating monasteries and the saintly images and shrines of the cathedrals of the most orthodox country in Europe—Russia.

ELECTRIC LIGHT NEWS

—— The village of Norwood, N. Y., is to have electric lights.

—— The Macon, Ga., Electric Light Company has recently added a new dynamo to its already extensive plant.

—— Work on the Tuskaloosa, Ala., electric light plant is progressing rapidly. The city will be lighted early in January.

—— Holden, Mo., is now supplied with electric lights, a dynamo having been installed which runs 43 arc lights, distributed about the village.

—— The plant of the Edison Electric Light Company, at the Union Depot, Troy, N. Y., has been leased for 50 years by the Troy Electric Light Company.

—— At the fourth annual meeting and dinner of the Boston Electric Club, held at Young's Hotel, Boston, officers elected at the last meeting were installed. About 40 members were present.

—— The Union Pacific Railroad Company has closed a contract with the Thomson-Houston Electric Light Company, of Palmer, Neb., to illuminate the shops and shop offices at Omaha, Neb., with electricity.

—— Wong Yep, the Chinaman who is about to introduce the electric light into China, is reported as saying that he has secured franchises permitting him to light all the leading cities in China, with electricity, excepting Shanghai.

—— The Allegheny County Light Company, of Pittsburgh, Pa., has ordered two arc light machines, Westinghouse new system, 60 lights each. This gives the Allegheny County Light Company a total capacity of 800 arc lights.

—— One of two electric light companies of Pueblo, Colorado, which began business a year ago supplying 800 incandescent lamps, now has 2,300 incandescent lamps and 70 arc lights. The other company's increase is nearly as large.

—— The electric lighting company at Old Town, Me., take power from the dam at Milford, and have stretched two wires across the river, using several small islands for purposes of erecting their poles. One span between poles is said to be over 400 feet in length.

—— The alternating current system of the Westinghouse Electric Company is very extensively adopted in Texas, the company now operating 15 central station plants in that State. The last contract was closed a few days ago with a corporation in McKinney for apparatus for a central station plant of 500 sixteen candle-power incandescent lamps.

—— The stockholders of the Allegheny County Light Company met a short time since, and decided to increase the capital stock to $1,250,000. The former capital was $500,000, and for the last six months the amount earned was $30,000 net, or 12 per cent. on the capital. The increase was made to cover the constantly growing business of the Company.

—— At a meeting of the St. Louis (Mo.) Illuminating Company, which recently absorbed the United Electric Light Company, the following officers and directors were elected: President, James Campbell; vice-president, J. D. Thompson; secretary and treasurer, C. S. Horton; directors, Jas. J. Davis, Alex. Ross, Henry W. Bond, James Campbell and J. D. Thompson. Messrs. Thompson, Davis, Ross and Bond, fill the vacancies in the directory caused by the resignation of Charles Nagle, L. J. Halthaus, A. More and W. F. Reid.

KINDRED INTERESTS

The Jewell Belting Co., of Hartford, Conn., in addition to a very extensive business of supplying leather belts to electric light companies, are engaged in the work of supplying the leather parts of the graphophone.

The Dwight Slate Mfg. Co., of Hartford, has just completed a new and improved spindle drill, to be used for drilling a series of holes through a pipe all at once. This company is manufacturing a good deal of the fine building machinery for electric light factories, and is just now filling a number of orders from abroad.

The Interior Electrical Conduit Company, of New York, has just issued a catalogue describing and illustrating the system of electrical wiring of buildings as owned by this company. The safety and value of this work makes it in popular demand, and although only recently organized for manufacturing, the company finds that it is cramped for room in its present factory.

The Ball Engine.—The Norwalk & South Norwalk Electric Light Company, of Norwalk, Conn., have just installed an 80 horse-power Ball engine, sold them by Messrs. C. R Vincent & Company, eastern agents for the Ball Engine Company. The California Electric Light Company, of San Francisco, Cal., recently purchased a 100 horse-power tandem compound engine from the Ball Engine Company, of Erie, Pa., for their station.

The Pratt & Whitney Co., Hartford, employs a force of some 800 men, and it probably engages in more diversified manufacture than any other concern in this country. Their electric work, of late, has become quite large, and in addition to their drilling machinery, which is found in probably every electrical factory in this country, they are doing a great deal of electric railway manufacturing for the big electric power companies.

Messrs. Billings & Spencer, well-known manufacturers of Hartford, in addition to supplying nearly all the leading electric light manufacturing companies of this country, are finding the foreign field a valuable one, and are shipping goods across the water. It is certainly a compliment to this company, as well as to this company, that we are able to find a market for such work on the other side, where manufacturing was supposed to have been reduced to a science years ago.

The Eddy Electric Mfg. Co., Windsor, Conn., operates one of the most complete and convenient electric motor factories to be seen in this country. Their motor work has increased with remarkable strides during the past year. The factory is well arranged, the engine room being particularly neat and clean. The company have ready for operation a complete water supply system, there being no water works at Windsor, and every facility is at hand for the prompt extinguishment of fire.

The Western Offices of the John T. Noye Manufacturing Company.

The manufacture of the Rice automatic engine will hereafter be in charge of Messrs. Fairbanks, Morse & Co. This latter well-known and responsible house becomes, in accordance with recently completed arrangements, the western representative for the sale of the Rice automatic engine through their houses in Chicago, St. Louis, Kansas City, Omaha, Denver and St. Paul, and the territory includes Michigan, but not Ohio or any territory east of that State. The rapidly increasing sale of the Rice engine made this step necessary and expedient, and will undoubtedly greatly increase the business of the company in the West.

Calendars of Electrical Companies.

The REVIEW office is indebted to a number of electrical friends for calendars for the year. Very attractive and striking ones have been received; from the American Electrical Works, Providence, on which appear, a picture of the attendants at the clam-bake of this company in 1888, and besides electrical history is given in a tablet, making a very neat calendar; from Alfred F. Moore, Philadelphia, who sends a large calendar, in which the dates appear in white figures on a black background; from the Shultz Belting Company, St. Louis, illustrating their factory and belting in colors; from the Southern New England Telephone Company, giving a map of the territory covered by this company; from J. Elliott Shaw & Co., Philadelphia, a very neat little calendar in the form of their Norway electric bell; from John A. Roebling's Sons Co., New York, a very striking calendar illustrating their wire rope and wire manufacturing, with the aid of a number of very interesting appearing cupids; and from the Holtzer & Cabot Co., of Boston, an animal picture, with a very life-like tiger in the foreground, making one of the handsomest calendars we have received.

The Board of Electrical Control of New York.

TO THE EDITOR OF ELECTRICAL REVIEW:

Your timely and truthful article—"New York's Government"—in your issue of 4th inst., states the case pointedly and impressively. But, in thinking over this subject of subways and the incompetent Board of Electrical Control, the great wonder is, that, not until this late day—when the mischief has advanced so far as not to admit of improvements such as the needs of underground service require—has a voice from the electrical profession cried "halt" or publicly protested against the incompetent political commission. The "Butcher," the "Theatrical-Ticket Agent," the "Audacious Lawyer," on the contrary have been the recipients of social favors and courtesies from the electrical fraternity; have been spared adverse criticism, have been wined, dined and feted, while honorable and capable electricians have been allowed to pass unnoticed.

Was it not the duty of the electrical interests to *early* protest against the commission being composed of such a trio of ignorance concerning things electrical? "Jake" could pull "underground wires" for an East Side Convention of political "heelers;" Morse (R. E.) could get up an attractive bill for a "run" of 100 nights; as for the "Audacious Lawyer," the Lord only knows what he is worth, unless to show how much brass can be put into one human form!

Think of a great public work of such magnitude as these subways being intrusted to such incompetent persons!—that a "deal" involving the governor and lesser lights of the "Hall" was necessary to give the proper "pull" to certain political dependents!

What pleasant reading and reflections to the taxpayers of this city your article suggests! Could you not give a few more much desired lessons—say, "The *Inside* History of Subways," with an appendix concerning the "*Fonix* Construction Company"—all of which might inform us how much money it cost the city to put holes in the ground, in order that we might not have light, but darkness, and revive the old industry of wood-chopping!

Yours truly,

New York, Jan. 10. P. K.

The Rhode Island State Electric Lighting Association.

The central station companies doing business in the State of Rhode Island, met Thursday, January 7, for the purpose of organizing a State Association. A majority of the companies and about 75 per cent. of the capitalization in the State was represented. Letters were read from the officers of companies who could not attend, expressing their approval of the movement and pledging their co-operation.

The organization was effected by the election of the following officers:

President, Samuel P. Colt, Bristol Electric Light Company.

Secretary, Samuel G. Stiness, Pawtucket Gas and Electric Light Company.

Treasurer, Marsden J. Perry, Narragansett Electric Lighting Company.

The officers of the Association constitute its executive committee. This is the fourth State Association that has been formed.

Death of Amzi S. Dodd.

Mr. Amzi S. Dodd, treasurer of the Metropolitan Telephone and Telegraph Company, died of brain fever at his daughter's residence in this city, Friday of last week. Mr. Dodd was very well known in electrical and business circles of the East, and was a highly respected member of the Electric Club. His death will be universally regretted.

Mr. Dodd had been out of health for four months. Three weeks ago he was taken ill with meningitis, and his condition rapidly grew critical. He had been stopping at the Barrett House, but on becoming very ill he was removed to his son-in-law's residence. Mr. Dodd leaves a widow, and a son and a daughter, both of whom are married.

He was born in Rochester, N. Y., nearly 58 years ago, and received a common school education. When 20 years old he came to this city and obtained a situation as assistant cashier in the Marine Bank. Becoming imbued with the idea that money was to be made in a parcel and baggage express business, in 1859 he started the New Jersey express in Newark and this city. He began this venture with two horses and two wagons. The business grew rapidly, and in a short time Mr. Westcott joined Mr. Dodd in the business in this city. In 1872 another change was made, when the business was sold to the New York Transfer Company, of which Mr. Dodd became a director and secretary. From the original plant of two horses and wagons, the company now has use for 550 horses, 400 vehicles and employs 400 men.

During the past 30 years—except for an interim of eight years—Dodd's Express and the Transfer Company have handled the United States mails in this city.

Mr. Dodd was one of the first men to become interested in telephones, and was largely instrumental in the organization of the Metropolitan Telephone Company. Associated with him in its organization were Theodore N. Vail, ex-Postmaster Henry G. Pearson, William A. Woolverton, Mr. Holmes and F. T. R. Brady. Mr. Dodd was its treasurer. Mr. Dodd was also interested in the Consolidated Telegraph and Electrical Subway Company and other telegraph and telephone organizations.

A characteristic of Mr. Dodd was his popularity with the workingmen in his employ. Till his death he retained the active management of the Transfer Company, and not a few drivers called to inquire of his condition during his sickness. Many stories are told of his kindness to employés, and on more than one occasion the bills of funeral expenses of the wives of drivers he ordered to be sent to his office.

When the Knights of Labor were organizing local assemblies of workingmen and ordering strikes, says the New York *Times*, they tried to get the drivers of the mail vans to join them. The drivers threatened a strike, but Mr. Dodd called them together and told them they were sworn officers of the Government, and if they persisted in their determination to strike he would have them arrested for conspiracy and neglect of duty. They did not strike, and 10 days later he asked them if they intended to do so. They said they had given up the idea. "Then," said Mr. Dodd, "I'll advance your wages," and he did so.

The funeral took place Sunday last, at 2 o'clock, at the Church of Transgression. His remains were conveyed to Long Branch, Monday, by special train, at 12 o'clock, M.

The following were the pall bearers: Dodd's Express—Wm H. Woolverton, Geo. W. Stetson, Wm. Thompson, S. Carpenter; Telephone & Telegraph Company—Theo. N. Vail, Thos. T. Eckert, Dr. Norvin Green; Subway Company—John Jamieson, Jos. P. Davis; and personal friends—J. Van Ness Smith, Luke A. Lockwood, Con. Frank Hatton.

* * At the last meeting of the Physical Society, of London, England, much interest was created by some very beautiful experiments by Mr. Shelford Bidwell, F. R. S. In one of these experiments a powerful electric light cast a shadow of a steam jet upon a screen, but the shadow was barely visible, nor did the jet appear very brilliant under the illumination. A needle point was then held near the jet, and electrified by being connected with a Wimshurst machine. Instantly the shadow became conspicuous and of a dark brown color, while the jet itself became far more luminous and occasionally colored. The effect of the electrification is apparently instantaneous. It is probable that the explanation may be closely connected with Lord Raleigh's well-known experiment of electrifying a jet of water, which then ceases to scatter and fall in small drops, but instead draws itself together and falls in large, faltering drops. As Lord Raleigh's experiments explain the large drops associated with a thunder storm, so Mr. Bidwell's seem to throw some light upon the cause of the extraordinary blackness of the thunder clouds and the lurid light so often seen in the sky before a storm.

ELECTRICAL PATENTS

INDEX OF INVENTIONS FOR WHICH LETTERS PATENTS OF THE UNITED STATES WERE ISSUED ON JANUARY 7, 1889.

418,678 Electric switch for motors; Harry H. Blades, Detroit, Mich., assignor to Detroit Motor Company, same place.

418,682 Ear-phone rest; George E. Christie, Paterson, N. J.

418,685 Brush-holder for dynamos; Peter Claus and Eugene Geugenbach, New York, N. Y.

418,700 Secondary battery. 418,701 418,702 Cut-out for secondary battery. 418,703 Method of forming secondary battery plates. Harry E. Dey, New York, N. Y., assignor to Phoebus H. Alexander, Hyde Park, Mass.

418,748 Distribution of electricity by secondary batteries; George B. Prescott, Jr., Newark, N. J., assignor to the Electrical Accumulator Company, New York, N. Y.

418,757 418,758 Electric arc lamp; Chas. E. Scribner, Chicago, Ill., assignor to Western Electric Company, same place

418,766 Support for electric conductors; Joseph B. Smith, Manchester, N. Y.

418,778 District telegraph alarm box; Chas. G. Armstrong, Englewood, assignor by direct and mesne assignments to himself and George A. Harmount, Chicago, Ill.

418,824 Lightning arrester; Elmer A. Sperry, Chicago, Ill., assignor to the Electrical Supply Company, Ansonia, Conn.

418,837 Battery carbon; Charles G. Armstrong, Chicago, Ill., assignor to George A. Harmount, same place.

418,850 Cable railway signal; John H. Pendleton, Brooklyn, and Andrew Bryson, Jr., and Cornelius Tiers, New York, assignors to the Rapid Transit Cable Company, New York, N. Y.

418,853 Electric motor or generator. 418,855 Incandescent lamp holder. 418,856 Carrier system. Imle E. Storey, Boulder, Colo.

418,871 Electrical indicating apparatus; George A. Holt, Oak'and, Cal., Mary E. Holt, administratrix of said George A. Holt, deceased.

418,889 Electric deep sea sounder; Alfred J. Copper and Eustace E. Wigzell, London, England.

418,893 Electrically propelled vehicle; Rudolph M. Hunter, Philadelphia, Pa.

418,910 Electrical signal-operating device; Chas. A. Cox and Joseph F. Cox, Louisville, Ky.

418,911 Electric heating apparatus for electric railway systems. 418,912 Method of transforming and utilizing electrical energy. Mark W. Dewey, Syracuse, N. Y., assignor to the Dewey Corporation, same place.

418,987 Electric arc lamp; Edwin C. Russell, Skowhegan, Maine.

419,082 419,083 Method of welding by electricity; Charles L. Coffin, Detroit, Mich.

419,059 Electric motor; Harry B. Niles, Union Springs, N. Y.

419,068 Electro-mechanical time stamp; Charles A. Randall, London, England, assignor to the Electric Date Stamp Company, East St. Louis, Ill.

419,111 Insulated nippers; Firmin M. Casey, Mount Vernon, N. Y.

419,166 Electro-magnetic transmitter; John T. Williams, Mount Vernon, N. Y., assignor to the International Portelectric Company, New York, N. Y.

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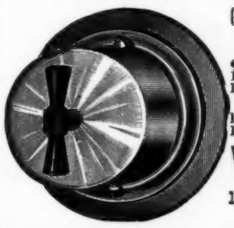

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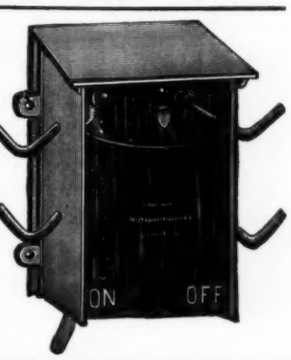

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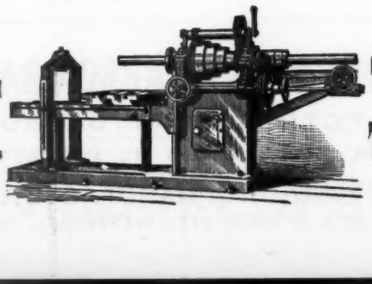

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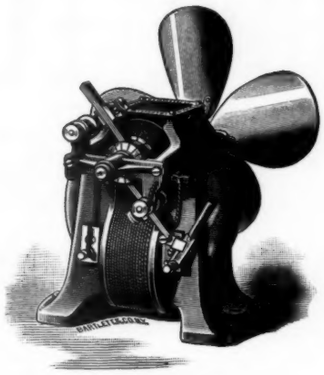

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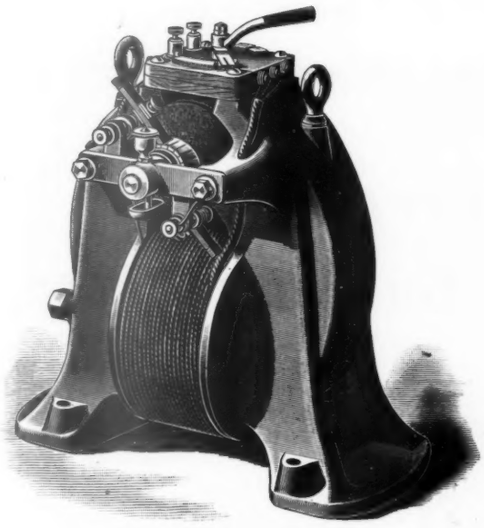

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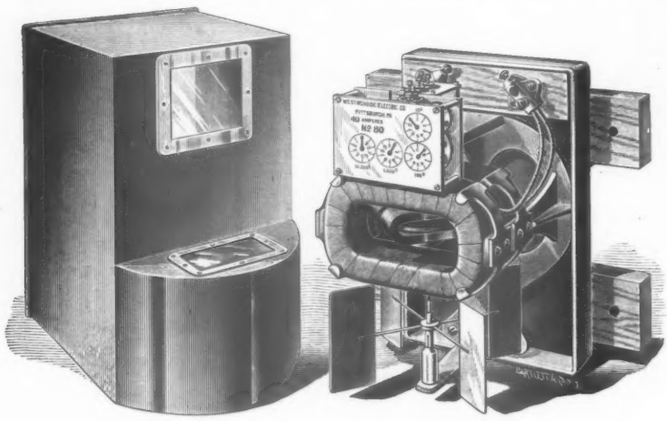

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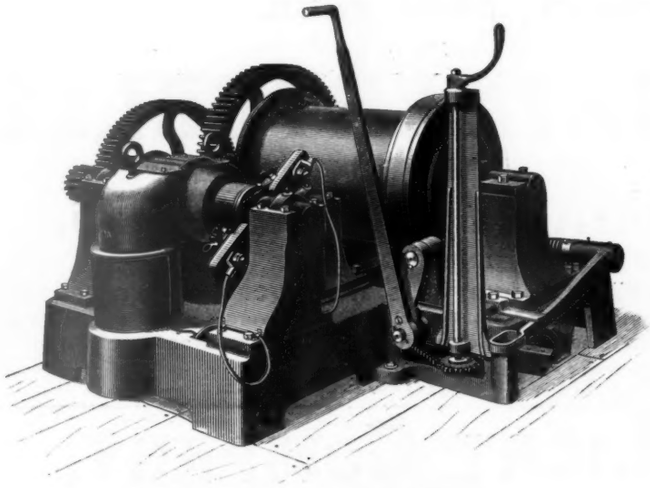

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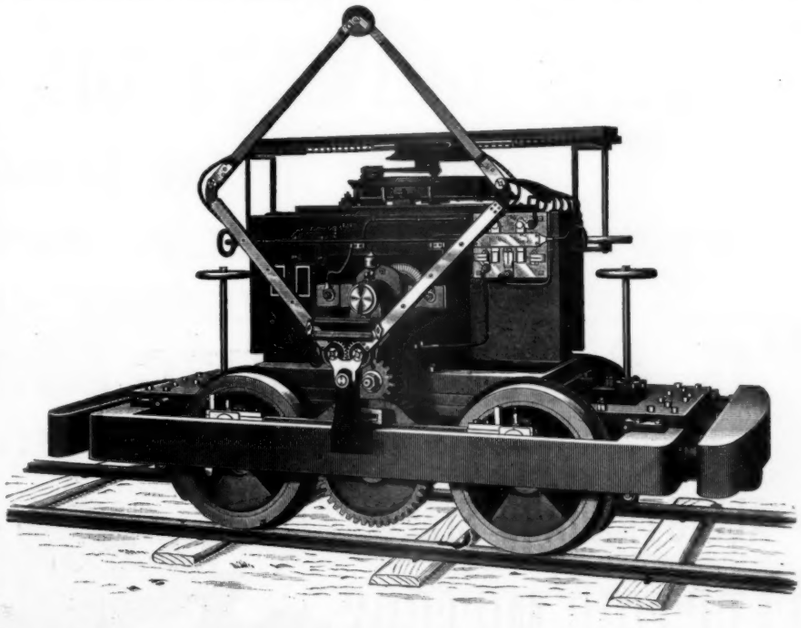

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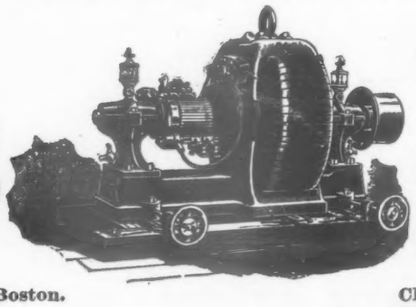

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							5,000 FEET PER MINUTE.	
C	8	.....	.....	.....	6.5	1¼		530
C	.....	10	.....	.....	6.3	1½		530
C	.....	.....	.....	25	8.0	2		530
E	16	.....	.....	.....	12.0	2½		780
E	.....	20	.....	.....	12.5	2½		780
E	.....	.....	26	.....	13.0	2½		780
E	20	.....	.....	.....	15.0	3		990
E	.....	25	.....	.....	15.6	3		990
E	.....	.....	32	.....	15.0	3		990
E	.....	.....	.....	50	16.0	3		990
G	28	.....	.....	.....	21.0	4½		1,380

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							5,000 FEET PER MINUTE.	
C	.....	85	.....	.....	21.0	4		1,360
C	.....	.....	5	70	21.0	4		1,360
C	.....	.....	.....	.....	21.0	4½		1,360
H	40	.....	.....	.....	29.7	6		1,750
H	.....	70	.....	.....	30.0	6		1,750
H	52	.....	64	.....	29.5	6		1,750
I	.....	65	.....	.....	38.0	8		2,290
I	64	.....	83	.....	38.6	8		2,290
I	.....	80	.....	.....	38.0	8		2,290
L	75	.....	.....	.....	46.5	10		2,770
K	.....	.....	.....	.....	47.1	10		2,770
K	.....	.....	.....	.....	52.5	12		3,200

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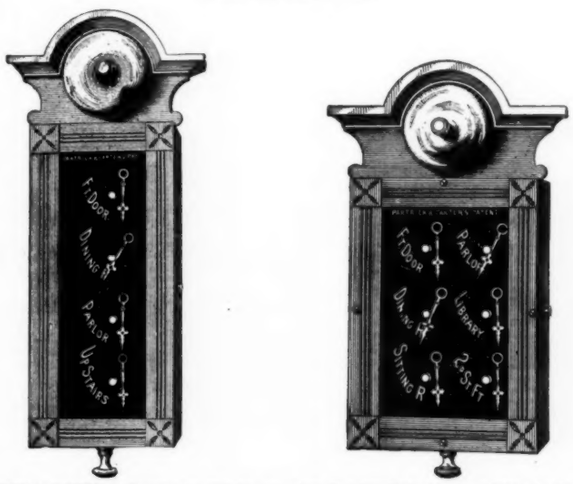

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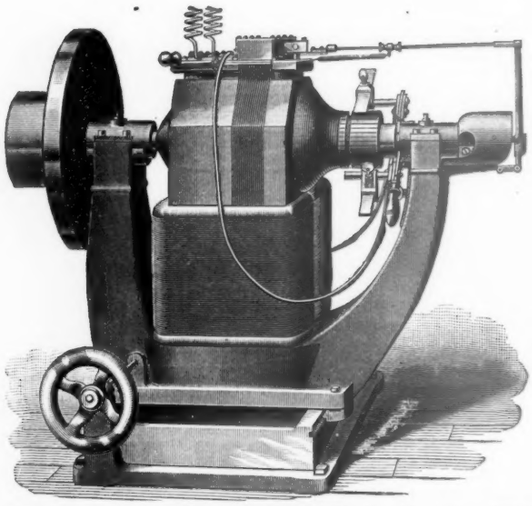

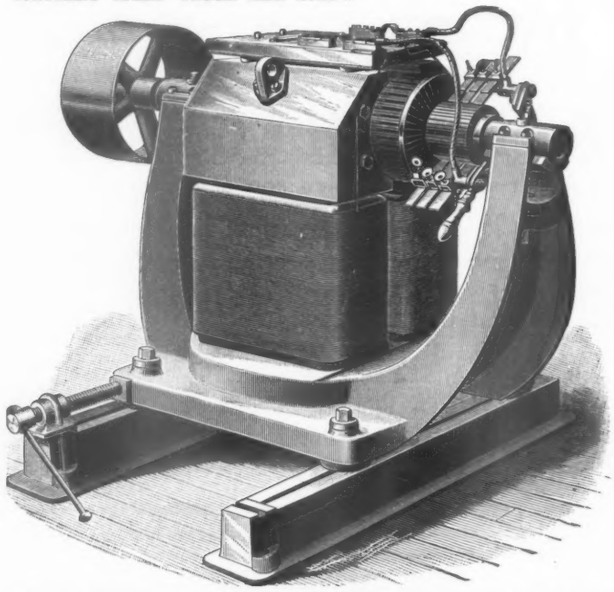

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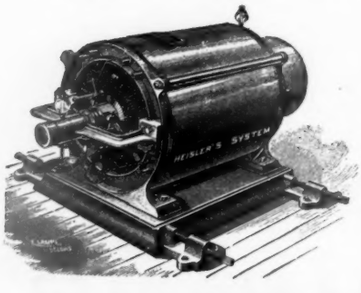

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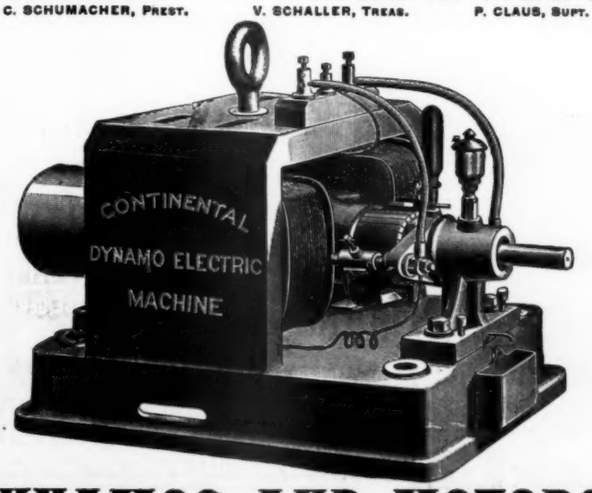

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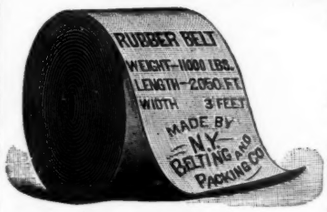

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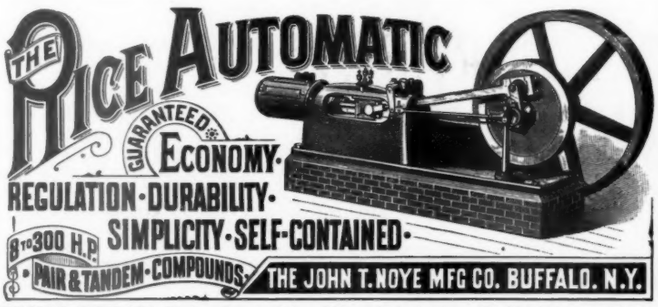

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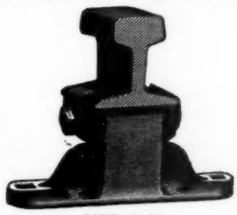

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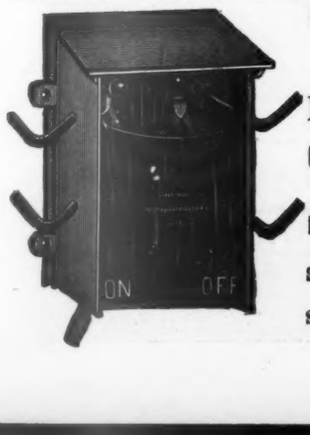

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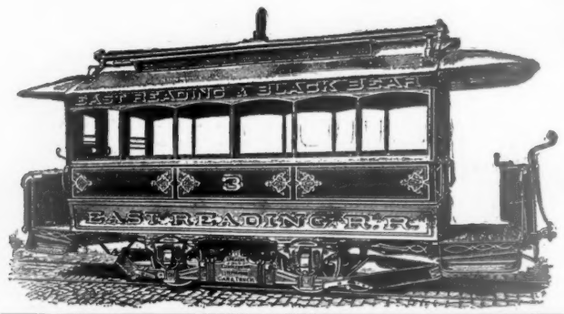

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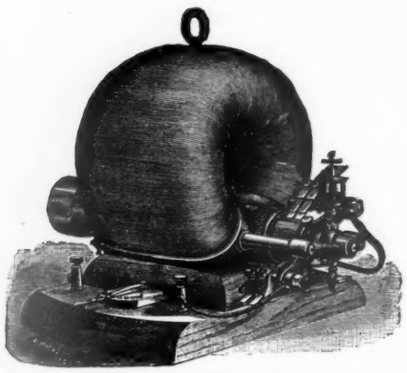

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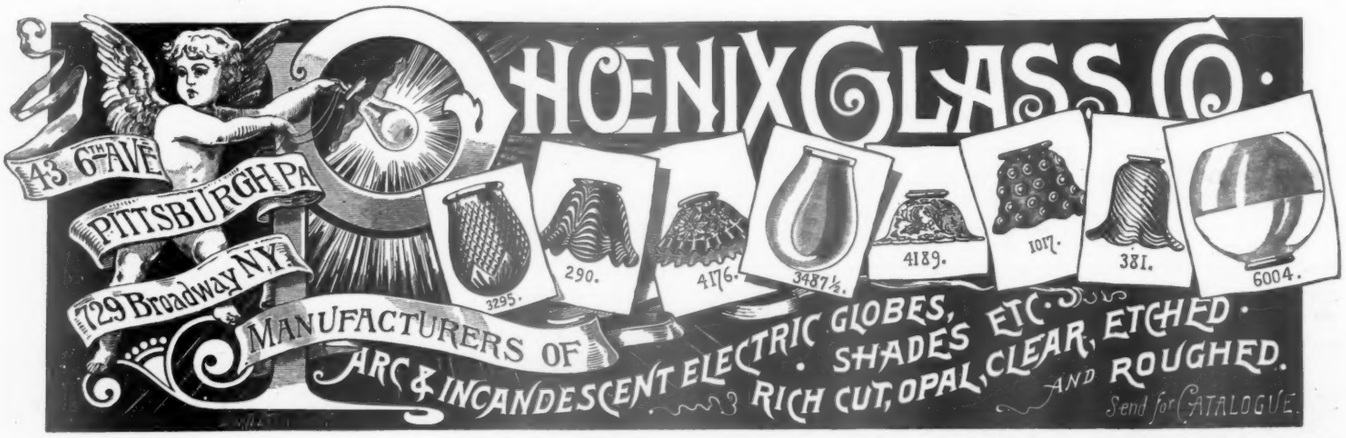

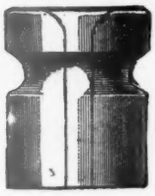

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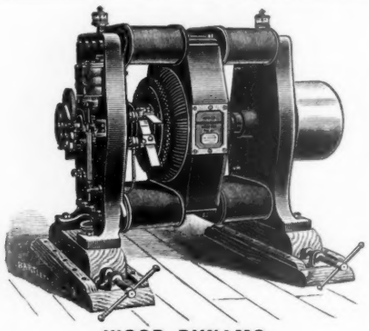

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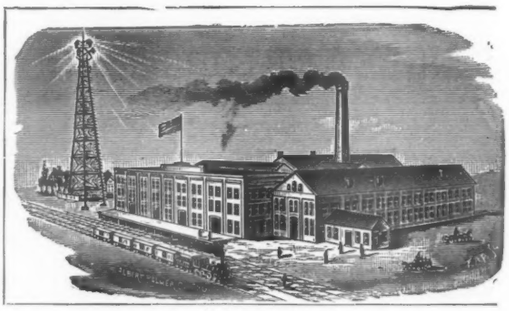

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ILLUSTRATED.

A WEEKLY JOURNAL OF

Electric Light, Power, Telephone, Telegraph and Scientific Progress.

VOL. 15, No. 22. WEEKLY. | NEW YORK, SATURDAY, JANUARY 25, 1890. | $3 per annum. Single Copies, 10 Cents.

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Entered at Post Office, New York, as Mail Matter of the Second Class.

PROF. CROSS AT THE ELECTRIC CLUB.

THE ACOUSTIC PRINCIPLES OF THE TELEPHONE ENTERTAININGLY PRESENTED—PRESIDENT MADDEN'S ADDRESS—THE ATTENDANCE, DISCUSSION, ETC.

The meeting of the Electric Club, January 16, was one of the most largely attended and highly enjoyable Club meetings held since this influential electrical organization has existed. The lecturer of the evening was Prof. Chas. R. Cross, the widely known Professor of Physics of the Massachusetts Institute of Technology, Boston, and whose name attracted an audience that filled to overflowing the large parlors of the Club. The title of Prof. Cross's lecture was the "Acoustic Principles Underlying the Art of Telephony," and by means of apparatus brought with him from Boston, he most interestingly and graphically illustrated the different points of the discourse, which was made entirely without notes, with a fluency and clearness that caused it to be received with abundant applause. The lecture, with the interesting discussion which followed, will appear in a subsequent issue of the REVIEW. The discussion was participated in by Prof. Geo. Forbes, of London; Prof. Le Conte Stevens, of Packer Collegiate Institute, Brooklyn; W. D. Sargent, John J. Carty, Thos. D. Lockwood, A. V. Garratt and others; Prof. Cross closing the discussion with some interesting remarks relating to the experiments of Helmholtz.

A unanimous vote of thanks to the learned lecturer was given with enthusiasm before adjournment.

At the opening of the meeting, President O. E. Madden in the chair, some of the business matters of the Club were presented. After the reading of the minutes of the previous meeting, which the secretary presented in rhyme, the president made an interesting and comprehensive statement concerning the financial condition of the Club. His brief, yet complete, address was listened to very attentively, and the entertaining manner in which he presented facts and figures caused several interruptions from enthusiastic applause.

In the beginning President Madden stated that he was delighted at the large attendance of the members and their friends, and he took it not only as a fitting compliment to Prof. Cross, who had come at great inconvenience to himself from Boston to interest and instruct, but he took it to be an evidence of the interest in the objects for which the Electric Club was established, and which argued well for its future prosperity and success. Continuing, General Madden said: "Since the last regular meeting of the Club, I have been called to the office of President by your Board of Managers to fill the vacancy caused by the resignation of Mr. Gilliland. I am not unmindful of the honor thus conferred upon me, nor lacking in appreciation of the responsibility of the position. It shall be my aim and endeavor to advance the interests of the Club in every way to the best of my ability. In this, however, I cannot hope for the greatest success unless I am assured of the co-operation of each and every member of the Club, which I sincerely trust will be accorded to me."

The president then presented a financial statement of the Club affairs, which he stated, while showing that the Club needed, and would need, the aid of its members, proved that the Club's finances were in much better shape than at any previous time, and expressed a very strong hope of being able to soon wipe out the floating debt, and at the same time reduce the bonded debt.

Letters were read which had been received from the Sawyer-Man Electric Company, P. H. Alexander, general manager, and the United Edison Manufacturing Company, H. Ward Leonard, general manager, forgiving in each case the amount of their bills for labor and fixtures furnished the Electric Club, each letter containing earnest wishes for the success of the Club, both of which were received with applause.

A cable message was also read from ex-President Henry C. Davis, of the Club, who is now in London, in which he wished the Club every success and accepted the proposition of the finance committee in settlement of his bill against the Club for moneys advanced at the time the Club House was fitted up, President Madden stating that General Manager G. G. Ward, of the Commercial Cable Company, had very kindly made no charge for the use of his line in sending and receiving messages. Attention was called to the fact that in several cases bond holders had signified their interest in the Club by presenting the finance committee with their present holding of bonds, and that the first lot received was from the Club's most distant member, John I. Sabin, of San Francisco, who presented the Club with $250 accompanied by his best wishes, and this example the president thought it was hardly necessary to dwell on.

After the adjournment of the formal meeting, a delicious lunch and Electric Club punch were set out in the back parlor, and the 150 or more members and visitors present enjoyed a delightful re-union 'round the table. Music by Mr. W. S. Hine and Lieut. F. W. Toppan, U. S. N., and recitations by Mr. John C. Tomlinson and Mr. Walter Pelham, added to the enjoyment of the evening. It was the unanimous expression of the very large number present, that the meeting was one of the most enjoyable in the history of the Club, and comprised probably as intelligent appearing and enthusiastic a body of men as ever assembled in a similar meeting.

There were a number present from other cities, and among them were Prof. Geo. Forbes and Sir John Swinburne, of London; Prof. Le Conte Stevens, Brooklyn; F. W. Webster, T. D. Lockwood and C. J. H. Woodbury, of Boston; R. K. Steen, Wilmington, Del.; J. A. Powers and father, Troy, N. Y.

Among those from New York were C. O. Baker, Jr., Gen. C. H. Barney, G. B. Coggeshall, J. C. Chamberlain, E. A. Colby, E. W. Carritt, W. M. Clark, J. J. Carty, F. Gottschalk, M. W. Garver, A. V. Garratt, A. S. Hibbard, H. P. Hungerford, W. S. Hine, E. J. Hall, Jr., E. A. Leslie, O. E. Madden, H. B. Miller, F. C. Mason, F. Z. Maguire, A. H. Patterson, E. F. Peck, W. S. Perry, J. C. Reilly, J. A. Seely, W. D. Sargent, H. L. Storke, J. H. Seymour, Lieut. F. W, Toppan, J. C. Tomlinson, Dr. S. S. Wheeler, George Worthington, Jesse H. Bunnell, Jos. Wetzler.

A number of the officers and members of the American Society of Civil Engineers, which was in session in New York, were present by invitation during the lecture, and were made at home by the members of the Club. Among these were W. G. Worthen, of New York, and James B. Francis, of Lowell, both past presidents of the society.

It was announced that the next regular meeting would be February 20, at which time Hon. Grosvenor P. Lowrey, a prominent member of the Club, would deliver an address on "Patent Law, and What Constitutes an Invention."

Lamps in their Helmets.

In an entertainment given at a village in Illinois a few nights ago a novel use of incandescent lamps was made. Several young ladies gave a drill in military costume. Their helmets were surmounted with three incandescent lights, with red, white and blue globes. In certain parts of the drill the lamps were suddenly illuminated, and the effect was striking. The means by which this was accomplished was extremely simple. A converter was placed on the outside of the building in which the hall was located. The secondary wires ran under the floor to brass plates about three inches square, arranged in twos on the stage floor. From the lamps on the young ladies' helmets concealed wires ran down to little brass plates in the heels of the shoes. After concluding a series of evolutions each young lady would come to a stand in the front of the stage and plant her heels firmly on the plate on the stage. The lights would flash up and contribute greatly to the general effect.

Electrical Control.

[*From the N. Y. Tribune.*]

The first formal attempt to embody in legislation the universal opinion that electric currents must be put and kept where they belong, has just been made at Albany. We cannot convince ourselves that it is a happy effort. Senator Roesch, of the Seventh New York District, introduced a bill recently creating a State Board of Electrical Control. So far so good. The caption of the measure may be admirable, but the contents are not pleasing. The bill provides that the board shall consist of three members, one Republican, one Democrat and one expert, to be named by the Governor and confirmed by the Senate. Of course, it is possible that all three of the commissioners so selected might be experts, since the bill does not in terms forbid it, but the chances that they would be are extremely small. It may have been the Senator's intention to surround his proposed board with an atmosphere of non-partisanship, and we shall be glad to hear that he thinks he has succeeded; but however important the element of disinterestedness may be, it is not the only essential. The existing Board of Electrical Control has been more or less non-partisan, in one sense of the term, and yet we don't honestly think that it has been a success, even in its own private estimation. Political impartiality may be a good thing, but without a very liberal admixture of knowledge, skill and conscience, it will never succeed in solving the manifold and perplexing problems which the domestic use of electricity involves.

An Appeal to the Intelligent Portion of the Citizens of New York.

BY P. H. VAN DER WEYDE.

What would the intelligent people say if we had a city government which hired a mob to destroy with reckless hand the gas mains which distribute the means for public illumination in our streets and houses, and contribute so much to our comfort and safety? And this, forsooth, because a few persons had been killed by suffocation or gas explosions, or a few fires had occurred which could be traced to gas as a cause.

What would the sovereign people say if they had a city government which would make war against the use of steam boilers, and send its hirelings right and left to destroy thousands of dollars worth of private property, and so deprive industry of the use of steam power, the greatest boon by which industrial enterprise has lifted the American nation to a level, equal, if not superior, to any other civilized people on this terrestrial globe? And this, forsooth, because a few men had been injured by escaping steam, or killed by the bursting of a boiler.

The intelligent portion of the people would of course consider such wanton destruction as an act of vandalism, worthy of the savages of the islands in the Pacific Ocean. The intelligent portion of the people understand, also, that no government has a right to destroy private property in time of peace, and that even in time of war, when such destruction may be required for national defence, the government commanding it always feels itself in duty bound to compensate the owners afterward for the losses they had to suffer for the sake of the public good.

What then must be said of a city government which makes itself guilty of the destruction of devices which give us an illumination far superior to gas, and which distributes steam or water power in a manner not dreamed of less than 20 years ago? This not alone, but a government which lends itself to be a tool in the hands of designing politicians, and of such competing interests as should always be left to themselves.

What again must be said of a government which in place of being impartial in the competition between different private enterprises, abuses the power confided to it, and not only favors one side, but wantonly destroys the property of the other side? Even the Czar of Russia would hesitate to allow such acts to be perpetrated, because he, autocrat as he is, has common sense enough to know that destruction of property of whatever kind, if not commanded for national defence, is always a calamity and a loss to a nation, and a downward step from a higher to a lower degree of civilization.

That all this is true is evident from the fact that the real wealth of a nation does not consist in merely the accumulation of money in treasuries, either public or private, (*) but in the possession of appliances, intended to promote the possibility of giving to the greatest number of people the advantages of providing for their wants, not alone, but for their comfort and happiness also; it was the inventions of the first part of this century, the introduction of gas, and especially of the steam engine, which have contributed more to the public welfare and happiness than any other invention which preceded it.

Nobody will deny the disadvantages under which our great-grandfathers lived without the use of improved means of illumination, without machinery driven by steam, without railroads or without steam navigation

(*) Our country would be better off if, in place of the gold and silver now useless in the U. S. Treasury, we had the badly needed things that can be bought for that money, such as an ironclad fleet: and if our capitalists, in place of having to hide their surplus coin in safe deposit vaults, were allowed to buy ocean steamers where they can buy them cheapest and best, and to carry our glorious flag over the whole ocean as we did 30 years ago.

Such useless accumulation of treasures reminds us of the miser who had buried his money because he did not intend ever to use it. One day he found it stolen and a stone put in place. The advice was given him to imagine that the stone was his treasure, and it would be all the same.

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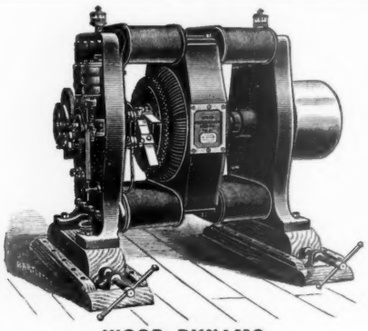

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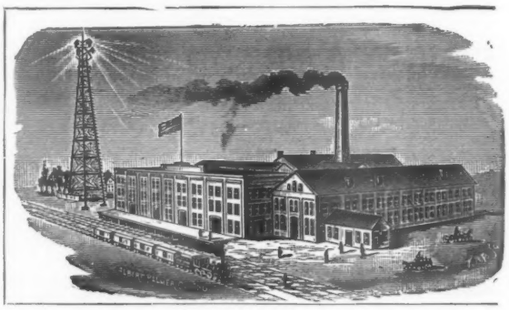

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